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PROLIFERATION MANAGEMENT IN THE THIRD NUCLEAR AGE:
A STRATEGY AND RULES OF ENGAGEMENT

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ABSTRACT

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FOREWORD

The concept of providing nuclear assistance, while not new, is a challenging and politically sensitive subject. This is because providing nuclear safety and security assistance to a new nuclear nation appears to run counter to established norms for containing the proliferation of nuclear weapons. Treaty based regimes, such as the Treaty on the Non-Proliferation of Nuclear Weapons, remain the best tool to prevent proliferation. However, once proliferation has occurred, and existing options to address proliferation have been exhausted, providing such assistance may reduce the nuclear danger both to the state and the international community. Reducing this nuclear danger is in the U.S. national interest.

This paper explores the viability of providing nuclear safety and security assistance as an additional option to address proliferation. It does not suggest that this option is necessarily relevant to today's new nuclear states. However, should proliferation accelerate in the future, the viability of providing security assistance may be validated. The assistance option should not be considered the only available solution, nor an option without costs and risks; but, it may at times in the distant future, be the best option. It is our intention to stimulate the critical review of the viability of this option, to encourage the reader to start thinking about the future well before its time and circumstances arrive.

EXECUTIVE SUMMARY

PROLIFERATION MANAGEMENT IN THE THIRD NUCLEAR AGE: A STRATEGY AND RULES OF ENGAGEMENT

... we have on too many, many occasions, for too many years, not had a coordinated, effective strategy against proliferation but have had a broad-based, highly bureaucratic policy that, in effect, cut off our nose to spite our face.

President Clinton

The world has entered a new and potentially more dangerous nuclear age, one with new and unpredictable players. A crucial aspect of this emerging age in international relations is the U.S. relationship with states that have the capability and have elected to become members of the nuclear club. A prominent although sometimes confused aspect of U.S. foreign policy has been the non-proliferation issue. As a first principle, the United States must continue to support the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), while realizing that despite the overall success of the NPT, proliferation has occurred and most likely will continue to occur. However, total reliance on the NPT, coupled with the reality that its protection is not absolute, creates a conflict between goals and actual results.

The challenge presented is to minimize the conflict between *policy* and *reality*. While complete and total non-proliferation is a worthwhile policy objective, it alone is incomplete; the United States should avoid being held prisoner to this ironclad rule. It is our contention that the United States, in order to reduce the threat of inadvertent or unintended nuclear explosions should, at some point, consider ceasing complete opposition to the emergence of a new nuclear state and be prepared to assist it. The assistance recommended in this paper is ex post facto; it

applies only when proliferation has already occurred. Therefore, there is no violation of the policy against proliferation. Nuclear assistance is an attempt to minimize the danger that the new nuclear state poses to itself, U.S. security and the world.

The purpose of this paper is to explore a new policy dimension for addressing the threat of nuclear proliferation; a policy based on cooperation - not conflict. While many experts have logically reasoned down the path toward cooperation, with many arriving at its doorstep, all have stopped short of developing a policy designed to inhibit the accidental or unauthorized use of nuclear weapons. This paper suggests a policy of cooperation to achieve this objective, and ultimately to slow, stop and eventually roll back proliferation based on strategies of cooperation.

This paper does NOT propose abandoning the NPT. The recent indefinite extension of the NPT is a major success for peace and stability in the post Cold War period. Viewed from the perspective of the international system, no tool better serves to check the threat of nuclear conflict or to support the objectives of national security and international stability.

Based on our review of past precedents and an analysis of policy options, our **recommendation** is that the United States should consider an *adaptive* and *flexible* policy toward a new nuclear state and be prepared to assist it in nuclear safekeeping if appropriate. This help might take the form of:

- Technical assistance to ensure warhead security and stability.
- Education and training assistance to ensure the physical safety and security of nuclear warheads.

- Doctrinal assistance in the development of command and control safeguards.

Although this may seem controversial, the reality is that it has been done before by the United States, has been successful, and can be done again.

A close examination of U.S. behavior since the end of World War II reveals that, although total nuclear non-proliferation has emerged as a goal and eventually an aspect of our stated formal policy, our actions have been remarkably flexible and adaptive to meet our long-term national interest in a stable international environment. Examples of this flexibility in the nuclear arena include:

- Past U.S. assistance to Great Britain, France, and the Soviet Union in ensuring the safety and security of their nuclear weapons.
- President John F. Kennedy's policy of not publicly challenging Israel on its nuclear weapons program.
- Provision in the 1991 Nunn-Lugar Act for assisting the New Independent States (NIS) with security and safety of nuclear materials.

This policy proposal offers the use of a conceptual model to frame the issue and organize program options. The assistance may be rendered through multiple avenues and means involving cooperation among various agencies of the U.S. government and its counterparts in other states; and direct contact such as technical laboratory-to-technical laboratory, military-to-military, university-to-university, or open press release. These recommendations are neither a strategic concept nor a tactical template designed to fit every situation. This new policy dimension cannot be used in isolation from other policy options existing within the current spectrum. Each case must be examined on the merits of its distinct local, regional and international application.

Potential objections to this adjustment in policy may include:

- The charge that this is encouraging proliferation and abandoning non-proliferation efforts.
- Legal and treaty related objections.
- The potential for disclosing aspects of U.S. nuclear secrets.

Each of these objections presents challenges, all of which have been overcome in the past. Each aspect and area of assistance must be closely calculated in terms of U.S. interests. It is also possible that this may occasionally be a two-way street, and that the United States nuclear program may benefit as well. However, the most compelling reasons for assisting a new nuclear state center on preventing the accidental or unauthorized use of these weapons, and on the potential leverage such action may give us.

The world has changed dramatically in the 1990's, and the alignment and rules of behavior of states continue to evolve. Certainly the spread of nuclear weapons is recognized as one of the greatest security dangers facing the United States today. The goal of non-proliferation has generally served the United States well. However, the realities of the nuclear non-proliferation dilemma at the dawning of the twenty-first century demand a reexamination and new analysis of past and future policy and action.

Chapter 1

The Third Nuclear Age

As troops strained at high alert during the summer of 1993, President Clinton challenged North Korea's continued existence as a nation over the issue of nuclear weapons proliferation. Not since the 1962 Cuban Missile Crisis at the height of the Cold War had the world come so close to war over the threat of nuclear weapons. How did it come to this? Worse yet, how could *similar events make war even more threatening* in June 1994?

This very real scenario illustrates a problem with current U.S. policy in the post Cold War period. The U.S. policy is one of strict and total non-proliferation. The drastic changes in international relationships throughout the world since the end of the Cold War have thrust us into what many scholars have recognized as the Third Nuclear Age.¹ The first passed when the Soviet Union exploded an atomic bomb in 1949, ending the United States' short-lived monopoly of the nuclear secret. The second, when a small club of five nuclear powers managed a cold war nuclear equation according to well-defined rules of behavior and crisis management, is also over. Now the world has entered a new and potentially more dangerous nuclear age as new and unpredictable players join the game.² The world of the late 1990's and beyond is far different from that of the past.

The threat to U.S. vital interests have changed. In the second nuclear age, the U.S. was able to focus on a single nuclear giant.³ The presence of the Soviet Union's powerful nuclear umbrella and extensive control and influence over several "would-be" nuclear nations promoted stability and unquestionably helped to control the proliferation of nuclear weapons.⁴ However, the dissolution of the former Soviet Union has resulted in instant nuclear nations. The removal

of the Soviet umbrella over former bloc nations and the questionable security of existing nuclear weapons and material within the Russian Federation have greatly reduced controls on the proliferation of nuclear weapons. The result has been an entirely new and different threat, one of increased potential for the spread of nuclear weapons capabilities. In a January 1996, policy statement, Secretary of State Christopher acknowledged that the "gravest potential threat to our [U.S.] security is the spread of nuclear weapons."⁵ Subsequently, he indicated, for the first time, the U.S. must focus on "defending against rogue and accidental/unauthorized [nuclear] threats."⁶

This increased threat of proliferation to U.S. security demands a flexible and responsive policy option in order to reduce the threat of a nuclear explosion and protect U.S. security interests. The purpose of this paper is to explore an additional policy option to deal with this threat: a policy based on cooperation, rather than conflict.⁷ While nuclear detonations may occur by design (authorized and intended), by accident, or through unauthorized use, each poses a threat to the U.S. and presents a hazard to the international community.⁸ In order to reduce the risk of an inadvertent or unintended nuclear explosion, the United States at some point should consider assistance to the new nuclear weapons state. This expansion of existing policy options, while undoubtedly controversial, is in fact well founded in U.S. historical practice and has arguably contributed to a perfect record of no accidental or unauthorized detonations of a nuclear weapon.⁹

The advantages of such a policy option must be viewed on two levels. In the short term, this option will greatly reduce the possibility of an inadvertent or unintended nuclear detonation.

The eventual benefit of such a policy is the potential leverage gained, which can be parlayed into influence used to achieve the long-term objective to slow, stop or roll back the spread of nuclear weapons, thus reducing the nuclear risk. The short-term goal is not to advocate the spread of nuclear weapons as a means of promoting regional stability, but rather to acknowledge that proliferation has occurred and to increase the safety and security of nuclear weapons so that the risk of accidental or unauthorized use is reduced.

The proposed policy raises a number of related issues to be examined in this paper. These fundamental issues are the rationale for this "new" policy option, the limits or constraints on nuclear assistance, the types of assistance to be provided, and conceptually, how safety and security assistance can be effectively implemented.

Preventing the use of nuclear weapons by denying possession, the goal of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), while clearly the most effective method, is only one method. The NPT attempts to reduce the threat of nuclear weapons by prohibiting nuclear states from transferring nuclear devices or control over them to a non-nuclear state. The treaty also prohibits a non-nuclear signatory from receiving or manufacturing these weapons.¹⁰ The recent indefinite extension of the NPT is a major success for peace and stability following the Cold War period. Viewed from the perspective of the international system, no tool better serves to check the threat of nuclear conflict; no tool better serves the causes of national security and international stability. It has been debated, however, whether proliferation of nuclear weapons can be completely prevented in the future.

This paper assumes that proliferation will continue to occur despite the best efforts of the international community to prevent it.¹¹ While the United States should remain a strong advocate of nuclear non-proliferation, many recognize that this is insufficient.¹² The high priority of the current counter-proliferation effort validates this assumption. This is not a call for abandonment of non-proliferation efforts, nor is it a call to abandon the NPT. Both are important and should be continued. However, once proliferation has occurred, U.S. interests may be better served by having a broader spectrum of policy options. The policy of assistance, as advanced in this paper, could be interpreted as a component of the greater counter-proliferation effort.

Despite the success of the NPT, proliferation has occurred and will continue to occur. This presumption drives us to ask what actions should be taken, and to what end, when proliferation does occur. James Schlesinger is challenging us not to stick our head in the sand when he provocatively asks the question: "What happens when *Swaziland* gets the bomb?"¹³ A number of policy options exist to deal with the problem, ranging from the preemptive military strike considered against North Korea to doing nothing.¹⁴ However, before examining Schlesinger's question, we must first ask: What is the United States really trying to do?¹⁵ Answer: To slow, stop and roll back the spread of nuclear weapons capability in order to reduce the risk of their use. This goal, in fact, closely parallels the stated National Security Strategy to "cap, reduce and ultimately eliminate nuclear and missile capabilities" with regard to India and Pakistan.¹⁶ Current U.S. policy against proliferation does not resolve the question: what can the United States do once proliferation occurs?

Historical Precedent In Support of Assistance

The idea of cooperative assistance is not new. It has worked in the past and with excellent results. It was President Kennedy's concern over the possibility of "nuclear disasters" and the fear of "war by accident" that drove him to begin to make technical and procedural assistance available to existing nuclear nations, a practice that has continued to the present in varying degrees.¹⁷ It has served U.S. national interest to make information available to other states in order to avoid inadvertent detonations and to minimize the period of "nuclear adolescence," as will be summarized in chapter 3.

While the record of no accidental detonations is to be lauded, there have been close calls and growing pains that need not be repeated. No incident has loomed nearer to a total nuclear cataclysm than the crash of an aircraft in Greensboro, N.C., that triggered five of the six devices required to yield a nuclear detonation.¹⁸ The U.S. nuclear safety program, which is the best documented and in all likelihood the safest in the world, went through an evolutionary process of maturing nuclear weapons safety principles, procedures, and safeguards. A flexible and adaptive policy of assistance could shorten the maturing period and enhance safety and security in new nuclear states.

What Type of Assistance and How to Administer It?

As with all proliferation issues, there is no single solution for every case. The assistance policy should provide a mix of technical assistance to ensure warhead security and stability;

education and training assistance to ensure physical safety and security; and doctrinal assistance in development of command and control safeguard mechanisms. This assistance must be tailored on a case-by-case basis to changing circumstance.¹⁹ Examples of technical and procedural assistance that have been provided in the past are presented in chapter 5, as a tripartite model of assistance in the areas of safety, security and relationship building. This model is useful as an initial framework for successful assistance in the future. Recommended types of appropriate assistance, addressed in greater detail in chapter 4, are largely based on past experience. However, there is no simple one-size-fits all answer. Lessons learned from previous assistance serve as the cornerstone of the proposed policy option.

Program Challenges

Any assistance will, of course, come at a cost. The most widely recognized tradeoff is that of safety versus readiness. Sharing information on command and control safeguards, procedural doctrine, improved safety features, single-point safety and environmental sensing devices all lead to greater confidence in security, which in turn may lead to a state's willingness to accept the risks, now reduced, of greater readiness. Another great fear of cooperation is that technical advantages and improvements will be disclosed.²⁰ But in the final analysis, the argument consistently comes up in favor of assistance, as in the past, even in periods of increased tensions, such as immediately following the Cuban Missile crisis. For example, in December of 1962, just two months after the Cuban Missile crisis, in a public speech intended for the benefit of the Soviet Union, John McNaughton, deputy defense counselor, laid out in general terms the

U.S. permissive action link (PAL) system. The importance that the U.S. places on this system of electromagnetic locks and secret codes, with the support of the White House, was reinforced by U.S. scientists during the 1963 Pugwash Conference.²¹

There are other formidable challenges to an assistance option. Concerns that such assistance undermines non-proliferation efforts, rewards proliferation, and is in fact legally prohibited, all present resistance that must be overcome. Yet, these constraints and limitations, as examined in the next chapter, have been overcome in the past and are not insurmountable in the future. However, any proposed assistance should be carefully scrutinized. An assistance feasibility model for doing this is presented in the following chapter.

A FLEXIBLE AND ADAPTIVE POLICY

There is no single solution to the challenges posed by nuclear proliferation. Nor can the issue be easily isolated from other aspects of foreign policy. Our proposal of limited assistance is a series of alternatives within an option, to be used in combination with other policies as required. There is no exact template for what and when assistance should be given, merely an initial framework for analysis of individual situations. Assistance must be tailored to both domestic and international political conditions.²² The assistance offered will differ based on the identity of the recipient state and the time frame in which assistance is to be offered. However, the framework offered for examining types of assistance provides a structure for understanding

the constraints and potential technical costs that may be of assistance to senior U.S. leadership in making the decision as to who should receive assistance and when.

A plan for assistance must meet the special circumstances of the recipient state, and this plan, in turn, should be screened through the "Nuclear Assistance Feasibility Model." Only then will policy-makers be able to make an informed decision regarding the proposed assistance with all of its related ramifications.

The concept for providing assistance should be based on the development of a tripartite framework examining safety, security and relationship building. By constructing and analyzing a model, and examining a series of possible assistance proposals, the task of making the who, when and what decision becomes more systematic and effective. This adaptive policy is framed in the "Cooperative Strategies Model," developed and discussed in chapter 5. This assistance should improve security, halt accumulation, facilitate disposal, and increase transparency, thereby ultimately achieving both the short-term goal of reducing nuclear risk and the long-term goal of slowing, stopping or rolling back the spread of nuclear weapons.

Historical precedents support the appropriateness of this cooperative policy dimension as proposed; the successful results of achieving a similar goal in the past reinforce its correctness; implementation is feasible; and the U.S. has the knowledge and organizations to carry out such a policy. However, while the information and agencies to accomplish such a policy may exist, there is a need to develop a comprehensive framework which combines a number of elements

that may at times have been examined independently, but not as a complete package. The synergy of this added policy dimension is its greatest strength.

Chapter 1 Endnotes

1. The concept of a new nuclear age has been proposed in several articles, notably by Tim Zimmermann and Douglas Pasternak, "Critical Mass," *U.S. News & World Report* 17 April 1995: 39-45.
2. Fred Charles Iklé sees the nuclear age after the Cold War as more volatile and difficult to predict its ultimate outcome, in "The Second Coming of the Nuclear Age," *Foreign Affairs* January/February 1996: 126.
3. Ted Galen Carpenter argues that rapprochement between Washington and Beijing had already begun by the time China developed a credible arsenal, in "Closing the Nuclear Umbrella," *Foreign Affairs* March/April 1994: 10.
4. For the purposes of this study, "proliferation" refers to the spread of nuclear weapons to a nation-state, that was previously non-nuclear. The study does not address biological and chemical weapons or non-state actors.
5. U.S. Secretary of State Warren Christopher, address, Forum, John F. Kennedy School of Government, Harvard University, 18 January 1996.
6. U.S. Secretary of State Warren Christopher, State Cable 031567 (unclas): 222018z Feb 96.
7. The need to examine such an additional policy option has been recognized by numerous scholars, most notably William C. Martel and William T. Pendley *Nuclear Coexistence* (Montgomery, AL: Air War College, 1993); Joseph S. Nye, Jr., "New Approaches to Nuclear Proliferation," *Science*, vol. 156, 29 May 1992: 1293-1297; Michael Nacht, *The Age of Vulnerability* (Washington, D.C.: The Brookings Institution, 1985); and Robert Blackwill and Albert Carnesale, *New Nuclear Nations* (New York: Council of Foreign Relations Press, 1993).
8. Allison, et al., identify five different paths to nuclear war: accidental or authorized use; surprise attack; preemption in crisis; escalation of conventional war and; catalytic war in Graham T. Allison, Albert Carnesale and Joseph S. Nye, Jr., *Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War* (New York: W.W. Norton & Company, 1985) 10 .
9. Shaun Gregory, *The Hidden Cost of Deterrence: Nuclear Weapons Accidents* (London: Brassey's, 1990) 1.
10. U.S. Arms Control and Disarmament Agency (ACDA), *Arms Control and Disarmament Agreements: Texts and Histories of the Negotiations* (Washington, D.C.: USGPO, 1990) 99.
11. There are those who believe that future nuclear proliferation is not a given. See Thomas Graham, "Winning the Nonproliferation Battle," *Arms Control Today* September 1991: 8-13.

12. Carpenter, 9-10.
13. James R. Schlesinger, Foreword, *Limiting Nuclear Proliferation*, ed. Jed C. Snyder and Samuel F. Wells, Jr. (Cambridge: Ballinger Publishing Company, 1985) ix.
14. Nye stresses that governments lack of comfort in dealing with a postproliferation situations, prompt them to try to ignore it, in "New Approaches to Nuclear Proliferation," 1293.
15. Allison, et al., wisely remind us not to lose focus and ask the question: "What is the United States trying to do?" 3.
16. U.S. White House, *A National Security Strategy of Engagement and Enlargement* (Washington D.C.: The White House, February 1995) 14.
17. Edward Klein and Robert Littell, "Shh, Let's Tell the Russians," *Newsweek* 5 May 1969: 46.
18. Klein, 46; Gregory, 157.
19. Nacht, 1297.
20. Dean Acheson, an initial supporter of the potential benefits to be gained from dialogue and provision of information to the Soviets, stressed that the discussions did not have to necessarily go substantially beyond information that was already available in, James Chase, "Sharing the Atom Bomb," *Foreign Affairs* January/February 1996: 134.
21. Klein, 47.
22. Michael E. Brown poses five factors for examining conditions related to nuclear weapon dangers; similar type factors may also bare consideration here: the leadership, stability of the state in question, strategic circumstances of the state, technology, and negotiation of a nuclear transition, in Brown, "The 'End' of Nuclear Arms Control," *Arms Control: Contemporary Security Policy*, vol. 14, no. 1 (London: Frank Cass, 1993) 43-44.

Chapter 2

The Nuclear Assistance Option

U.S. non-proliferation policy, while extremely important, is only one aspect of an intricate and complex U.S. foreign policy, and must be weighed against other foreign policy demands.¹ Any non-proliferation policy option must be consistent with the broader context of U.S. foreign policy objectives. Therefore, any decision to render assistance to a new nuclear state must be firmly anchored in support of U.S. interests and must run the gauntlet of constraints, including, but not limited to political considerations, policy precedents, funding, domestic legislation and regional and international treaties.

A proposal for nuclear assistance to a new nuclear state is not analogous to shutting the barn door after the horse gets out. Rather, the purpose of assistance is to minimize the damage once proliferation has occurred by reducing the risk of an unauthorized or accidental detonation thereby gaining some degree of control over the situation. This control has the short-term advantage of reducing the threat and offers the potential long-term advantage of gaining leverage to reverse the proliferation. The cornerstone question is whether the advantages of rendering assistance outweigh the potential risk that assistance may encourage proliferation.

The dilemma between the risks of assistance and the potential benefits of assistance can be illustrated using a concept known as the "prisoner's dilemma."² The concept is based on mutually exclusive objectives among parties that are uncertain of each others actions, so that

arriving at a common solution, while not the optimum resolution for either party, is acceptable to both as the lesser of likely evils. For example, the United States does not want any new states to obtain nuclear weapons; however, once proliferation has occurred, nuclear assistance is preferable to an accidental detonation. A conflict arises between the U.S. long-term objective that the new nuclear state abandon its nuclear weapons program and the intention of the state to retain it. An acceptable compromise, somewhere short of a policy of conflict, may lie somewhere in the middle. What are the feasible alternatives? The solution which this paper presents is the option of a policy of cooperation in the form of limited nuclear assistance.

The concern that nuclear assistance encourages proliferation is reasonable. However, a nuclear weapons program requires a massive investment of resources and is a choice that has been made long before any U.S. decision to offer safety and security assistance has been contemplated. Nuclear proliferation has, in fact, already occurred before the consideration of the policy option of nuclear assistance as presented in this paper. The commitment of a state to its nuclear program is usually grounded in its perceived need for nuclear weapons for security or other national purposes that justifies the substantial outlay of resources.³ The nation will most likely not be persuaded or dissuaded in this decision by U.S. nuclear assistance.

THE NECESSITY OF A POLICY OF ASSISTANCE

Given the objections to nuclear assistance, the first question that must be answered is why the United States should consider rendering such assistance. While it will become clear from the

historical review in chapter 3 that assistance by the United States is not new, historical precedent alone is not sufficient to answer that question. Perhaps one answer can be given by considering what will happen if the United States does not render nuclear assistance to a newly proliferated state. If there is an accidental nuclear detonation, millions of people could die. Worse still, the detonation could be misconstrued by other nuclear neighbors and provide the catalyst for nuclear war.

Other confrontational policy options, such as economic sanctions and preemptive military action, are available. Recalling the Korea crisis of 1993-94, the problem with either of these options should be readily apparent. Economic sanctions, generally recognized by many scholars as having limited effectiveness, will not prevent an accidental nuclear detonation and will not enhance safety or security of nuclear weapons.⁴ In fact, these sanctions could, by placing a strain on the proliferated nation's resources, aggravate safety and security problems. This was President Kennedy's original concern -- a war by accident. The military attack option also may actually cause a nuclear detonation, either unintended or in retaliation. In addition, an attack may be a violation of international law.

Other reasons the U.S. might consider providing assistance to new nuclear states include reducing the threat to U.S. interests, mitigating the challenge to U.S. power, reducing the risk associated with former Soviet Union (FSU) style instability elsewhere, and fulfilling international obligations and responsibilities. Cooperative strategies of assistance can reduce the threat to U.S. interests by taking specific actions, such as providing safety and security

technologies, that influence the factors along the path to nuclear weapons use. Nuclear "non-use" is a core U.S. interest.

A number of policy options currently exist for dealing with proliferation. Between the extremes of doing nothing and a preemptive military strike to completely eliminate a state's nuclear weapons program there are a number of carrot and stick alternatives. Persuasive diplomacy choices include security guarantees, economic assistance or denial of such assistance, and economic or political sanctions. Each has its strengths and weaknesses, and is rarely effective when used alone. These options are depicted in figure 2.1.

Spectrum of Policy Options

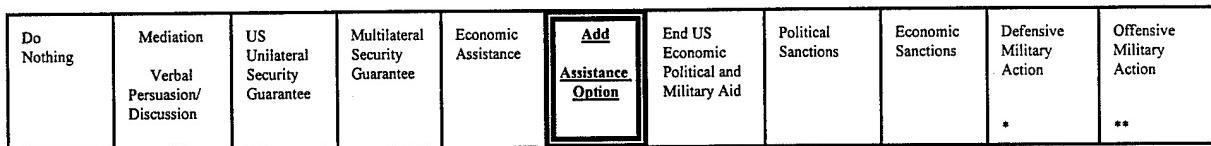


Figure 2.1

*Increased Intelligence Collection, Missile Defense Search Teams

**Destroy Nuclear Weapons and Delivery Systems

This paper proposes one additional policy alternative to be used in conjunction with other measures to achieve our immediate objective of reducing the likelihood of an inadvertent or unintended nuclear detonation and, ultimately, to slow, stop or roll back the spread of nuclear weapons.

CONSTRAINTS ON NUCLEAR ASSISTANCE

In interpreting and examining the constraints on U.S. nuclear assistance, it is helpful to develop a conceptual framework against which each type of proposed assistance can be measured in order to determine its feasibility. No policy recommendation regarding nuclear assistance would be complete without a discussion of the relevant constraints. Likewise, no discussion of constraints is complete without a conceptual framework which can be applied to the recommended assistance in order to determine its feasibility.

Development of the Nuclear Assistance Feasibility Model

There are three criteria against which all constraints on assistance can be measured: intent, consequences, and precedent. These criteria are depicted in table 2.1. **Intent** refers to the intended result of the proposed assistance as compared to the intent of each constraint on that assistance. For example, in the area of existing domestic legislative constraints, the intended result of the nuclear assistance proposed can be compared with the intent of the legislative constraint. If there is no violation of the legislative intent, then the proposed nuclear assistance can either be drafted within the intent of the constraint or a proposed amendment to the existing legislation can be drafted and justified.

Consequences refers to the expected result of the proposed assistance and the expected reactions of all the players involved in the domestic and international community. For example, proposed assistance to Pakistan would have a consequence for the nuclear capability of Pakistan,

and a political consequence in the relationship between Pakistan and the United States, but would also have a consequence in the relationship between the United States and India. All of these consequences should be carefully weighed in light of each of the constraints. The influence that the United States may gain or lose with all the regional players should be considered.

Finally, the proposed nuclear assistance may set a **precedent** for future U.S. policies and actions. The effect of this precedent should be carefully compared to each constraint. For example, funds appropriated for assistance to a nation might set a precedent for funding requirements in the future. Subsequently, a decision not to spend the same amount of money could be construed as favoritism in the first instance and hostility in the second instance. In addition, nuclear assistance could be considered inconsistent with past policy and deemed a dangerous precedent for future policy.

Nuclear Assistance Feasibility Criteria

Intent	Consequences	Precedent
National, Regional and International Goals	Reactions	Future Actions
Objectives of U.S. Policy	Regional & International Influence	Past & Future Policy
Funds Required	Continued Funding Required	Collateral Requirements
Legislative Objectives	Degree Meets or Violates Objectives	Past & Future Objectives
Objectives of Parties to Treaty	Degree Meets Objective of the Parties	Past & Future Effectiveness

Table 2.1

Prompted by an acute awareness of the need to maintain control of the atom bomb and the fear of nuclear proliferation, the United States and the international community imposed numerous constraints on nuclear assistance. Most of these constraints are based on an assumption that a world with more nations with nuclear weapons is inherently more dangerous than is a world in which a few nations possess massive arsenals of weapons. That is an assumption which exceeds the scope of this paper and thus will not be addressed. The volume of existing legislation makes it difficult to summarize the constraints in a general way and reach a conclusion in general terms as to the feasibility of specific nuclear assistance. The policy-maker should measure each specific proposal for assistance against the applicable constraints. The Nuclear Assistance Feasibility Model depicted in table 2.2 and figure 2.2 is a tool that can be used for that purpose.

For convenience of analysis the constraints as developed in this paper are categorized as political impact, policy, funding, legislation, and treaties. In each instance of recommended assistance, the constraints will vary depending on the type of assistance, region of the world involved, and the legislation and treaties effecting that area of the world. Any U.S. policy of assistance must be flexible and adaptive.

Political Impact

Any recommended nuclear assistance will meet domestic resistance. There are those who strongly endorse the idea that any assistance whatsoever encourages proliferation. One of the primary motivations for obtaining nuclear weapons is to gain status in the international

community, and nuclear assistance should not elevate the status of the proliferated nation. In order to overcome this argument, it is important that the proposal not act as a reward for proliferation, but rather provide increased safety and security not only for the new nuclear state but for the rest of the world. In addition, assistance should provide the United States with more rather than less control over nuclear weapons programs throughout the world.

The nation assisted may also resist. A foe will likely resist on the basis that the United States is attempting to gain information and control over its nuclear program. Distrust may result in the belief that the United States will gain sufficient control of the proliferator's nuclear arsenal so that the U.S. can prevent the proliferator from using its nuclear weapons.

Assistance to a foe may be perceived by a friendly nation as a hostile act, and assistance to a friendly nation will certainly be perceived by a foe as an act of hostility. For example, assistance to North Korea might be perceived as hostile by Japan and South Korea; and should South Korea proliferate, U.S. assistance to South Korea would almost certainly be perceived as hostile by North Korea.

While the regional and international political impact of assistance must be considered, domestic support is the threshold factor that must be overcome. The Soviet Nuclear Threat Reduction Act of 1991 (Nunn-Lugar), which provided for nuclear help to the former USSR, as succinctly summarized by Harvard's Center for Science and International Affairs, "shows how safety, security, and proliferation worries can produce political will to provide nuclear help."⁵

Policy

There is almost unanimous agreement that the current United States policy regarding non-proliferation is to oppose it unilaterally. This paper does not propose abandoning that stated policy. Rather, it is based upon an assumption that proliferation is going to occur regardless of United States policy against it. The purpose of this paper is to provide another policy option, short of hostile acts against the newly proliferated state, in an effort to provide another policy option for making the world with more nuclear states a safer world by rendering limited nuclear assistance within the domestic and international constraints. The assistance recommended in this paper is ex post facto. Proliferation has already occurred. Therefore, there is no violation of the policy against proliferation. Nuclear assistance is an attempt to minimize the danger the newly proliferated state poses to itself and the world.

Policy constraints on nuclear assistance are significant. Any nuclear assistance on its face clearly violates the United States policy against non-proliferation. However, this has not prevented assistance in the past. Assistance must be justified in terms of past precedent and carefully drafted to reflect the intent of the assistance.

Funding

In an era of dwindling resources and the continuing battle of the budget in the United States, funding for nuclear assistance will be a continuing problem. The Nunn-Lugar program, which was reduced in the 1995 budget, was sold to Congress as a program to dismantle the

nuclear weapons of a foe, thereby increasing the security of the United States. It will likely be more difficult to obtain funding to assist a nation in the safety and security of its nuclear arsenal. However, it should be noted that nuclear assistance is not very expensive compared to the other policy options. Consider the cost of the arms race during the Cold War compared to the cost of implementing Nunn-Lugar.

Legislation

The cornerstone of U.S. legislation regarding proliferation of nuclear weapons is the Atomic Energy Act of 1946 (The McMahon Act). Prompted by fear of the power of the atom bomb and the spread of technology to foes, the McMahon Act “prohibited any transfer of nuclear information or materials to any other state on pain of severe penalties.”⁶ Prior to the passage of this Act, the United States had previously rendered assistance to the British. In an attempt to ease the restriction regarding the British, Congress passed an amendment to the McMahon Act, the Atomic Energy Act of 1954, which permitted the United States to transfer to allies certain information regarding the effects and characteristics of nuclear weapons.

It was not until 1958, with the passage of the Second Amendment to the McMahon Act, that the United States was able to render substantial nuclear assistance to allies. This Amendment allowed the transfer of “Restricted Data” to allies. The legislation in the 1950's was directed toward NATO and the expansion of the nuclear capabilities of NATO allies in response to the increasing Soviet threat.

While initially it appears that domestic legislation prohibits all assistance other than that allowed by the Amendments to the McMahon Act, an analysis of the intent and language of existing legislation leaves the question open to interpretation. In the Arms Control Non-Proliferation Act of 1994, Section 714, Congress enacted an amendment to the Arms Export Control Act, which provides as follows:

Decisions on issuing export licenses under this Section shall be made in coordination with the Director of the United States Arms Control and Disarmament Agency, taking into account the Director's assessment as to whether the export of an article would contribute to an arms race, aid in the development of weapons of mass destruction, support international terrorism, increase the possibility of outbreak or escalation of conflict, ...⁷

The assessment of the Director as to whether an export will contribute to an arms race or contribute to development of weapons of mass destruction is open to broad interpretation. So long as proposed nuclear assistance does not contribute to the building of a new weapon or an increase in the destructive ability of existing weapons, and is intended to make existing weapons more safe and secure, assistance does not appear to violate the legislative intent of the Arms Control and Non-Proliferation Act of 1994.⁸

Treaties

The Non-Proliferation Treaty provides in Article I as follows:

Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices, directly or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to

manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices ...⁹

Pursuant to Article IX, paragraph 3 of the Treaty, all states except the United States, the Soviet Union, Britain, France and China are non-nuclear weapon states which cannot receive assistance pursuant to the provisions of Article I.

Nuclear assistance such as proposed in this paper does not violate the Non-Proliferation Treaty. The assistance recommended will not transfer to any recipient nuclear weapons or nuclear explosive devices. The language of Article I states that each nuclear weapon state which is a party to the treaty undertakes not to transfer to any recipient whatsoever control over such weapon or explosive devices, directly or indirectly. It does not prohibit improving control over such weapons or devices for the purposes of safety, nor does it prohibit the transfer of devices that would provide improved security over such weapons or explosive devices. The proposed assistance *will not provide assistance over the control of use of nuclear weapons, but rather control over the safety and security of the weapons.* The intent of the assistance is *to control in order to prevent use versus control in order to facilitate use.* The Non-Proliferation Treaty prevents the transfer of technology that would improve control to facilitate the use of nuclear weapons. The assistance proposed in this paper relates exclusively to nuclear weapons already in existence and will not facilitate the use of those weapons.

At first glance, it might appear that the second part of Article I prohibits the proposed assistance. Part 2 of Article I provides "and not in any way to assist, encourage or induce any

non-nuclear weapon state to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices.” Obviously, proposed assistance regarding safety and security does not assist, encourage, or induce any non-nuclear weapon state to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, but it could be interpreted to assist, encourage, or induce control over such weapons or explosive devices. However, the proposed assistance in this paper seeks to *improve* controls already in place and *improve* security. Again, security is not mentioned in this provision and this policy only proposes improving devices already in existence. The recommended assistance is ex post facto and does not in any way encourage or assist any nation in acquiring or expanding an existing nuclear arsenal.

Stephen Miller, Director of the International Security Program at Harvard's Center for Science and International Affairs, sums up a commonly held assessment of safety and security assistance and its relationship to the NPT as follows:

Hence, it is apparent that the passage which enjoins the nuclear states 'not in any way to assist ... any non-nuclear weapons state to manufacture or otherwise acquire nuclear weapons' would apply to aid to any new proliferator. Consequently, nuclear assistance to post-1967 proliferators involving information about, technologies pertaining to, or testing of nuclear weapons would be not merely a potential threat to the NPT regime but a breach of U.S. obligations under the NPT, even if inspired purely by concerns about safety and security.¹⁰

However, there is no indication that safety and security assistance would help a new proliferator manufacture or acquire nuclear weapons. Furthermore, in the letter of submittal from

the Department of State to the President dated July 2, 1968, Secretary Rusk writes:

In broadest outline the Treaty is designed to (a) prevent the spread of nuclear weapons (Articles I and II); (b) provide assurance, through international safeguards, that the peaceful nuclear activities of states which have not already developed nuclear weapons will not be diverted to making such weapons ...¹¹

The intent of the Non-Proliferation Treaty is to prevent the spread of nuclear weapons.

And, the intent of the assistance proposed is to enhance safety and security once proliferation has already occurred. Therefore, the assistance recommended does not violate the intent or the letter of the Non-Proliferation Treaty.

The final step in developing a policy recommendation is to develop a proposal for action that will remove the constraint, or, as in the case of a more ambiguous constraint such as political and policy, minimize it. There is no entry in the column of the Nuclear Assistance Feasibility Table (table 2.2) labelled "Recommended Action" as this column will be completed by the policy-maker and must be situation and assistance specific.

Nuclear Assistance Feasibility Table

Constraint	Intent	Consequences	Precedent	Recommended Action
Political Impact	National, Regional and International Goals	Reactions	Future Actions	
Policy	Objectives of U.S. Policy	Regional & International Influence	Past & Future Policy	
Funding	Funds Required for Assistance	Continued Funding Requirement	Collateral Requirements	
Legislation	Legislative Objectives	Degree Meets or Violates Objectives	Past & Future Objectives	
Treaties	Objective of Parties to Treaty	Degree Meets Objectives of the Parties	Past & Future Effectiveness	

Table 2.2

This table is the basis for the Nuclear Assistance Feasibility Model (figure 2.2.) The policy-maker must first determine the specific nuclear assistance proposed. Then he should determine the **intent** of the recommended assistance, its **consequences**, and the **precedent** that will be set by rendering the assistance. The assistance recommended can then be passed through the constraint filter of political impact, policy, funding, legislation, and treaties to determine whether or not the assistance recommended is feasible and, if so, the actions required either domestically or internationally to remove or minimize the constraints. Additional situational-specific constraints can also be added to the model as required.

Nuclear Assistance Feasibility Model

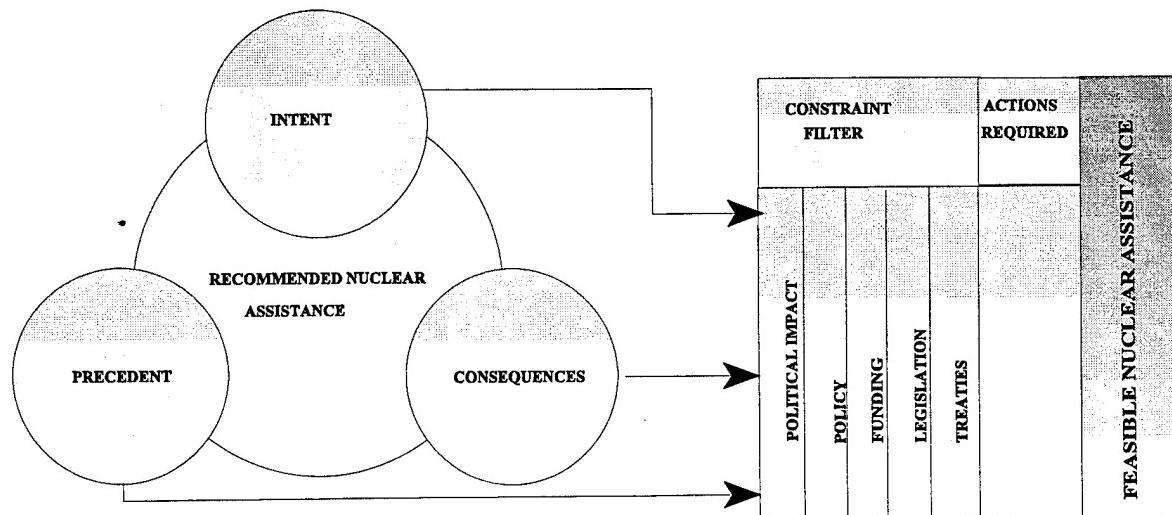


Figure 2.2

In conclusion, there is no absolute legal impediment to the type of nuclear assistance proposed. Neither legislation nor treaties absolutely prohibits assistance, and in fact, historically, as discussed in chapter 3, assistance has been rendered. The other three constraints -- political impact, policy, and funding -- must be managed carefully. While assistance may be given legally, the cost may simply be too high, depending on the state assisted and the situation. Nuclear proliferation is far from a simple issue; it is a complex series of problems without a single solution.¹² Consequently, any policy most likely must be used in concert with other options. The selected course of action may be the result of a choice among the lesser of evils. It is to the advantage of the policy-maker to use the feasibility model developed here to determine

the recommended assistance and the necessary actions required to eliminate or minimize the constraints on that assistance.

Chapter 2 Endnotes

1. Joseph S. Nye, Jr., "Diplomatic Measures," *New Nuclear Nations*, ed. Robert Blackwill and Albert Carnesale (New York: Council of Foreign Relations Press, 1993) 77.
2. The prisoner's dilemma is a frequently used strategy in game theory, where two parties are held incommunicado or are not trusting of one another; each party is willing to accept a limited punishment or restriction settlement for fear that the failure to accept these undesired conditions will result in far more severe, albeit unjust punishment. Each is told that if he alone implicates his partner, he will escape unscathed, but if he remains silent, while his partner confesses, he would be punished particularly harshly. If both remain silent, both would be let off lightly, but unable to coordinate their stories, each is better off implicating the other, no matter what the other does. The concept is addressed as one game theory in Avinash K. Dixit and Barry J. Nalebuff, *Thinking Strategically* (New York: W.W. Norton & Company, 1991) 11-14, 90-118.
3. Lewis Dunn attributes military considerations as the primary incentive for a state to pursue a nuclear capability. He also recognizes that political and economic incentives are also served. A state's international status is elevated as well as its domestic prestige, in addition to satisfying bureaucratic and scientific pressures in Dunn, et al., *Global Proliferation: Dynamics, Acquisition Strategies, and Responses*, vol. 2 (McLean VA: Science Applications International Corporation, September 1994) 1-2.
4. Alexander L. George, *Forceful Persuasion* (Washington, D.C.: United States Institution of Peace Press, 1993) 50-54.
5. Stephen E. Miller, "Assistance to Newly Proliferating Nations," *New Nuclear Nations*, ed. Robert D. Blackwill and Albert Carnesale (New York: Council Foreign Relations Press, 1993) 111.
6. Miller, 111.
7. U.S. Congress, Committee on Foreign Relations and Committee on International Relations, *Legislation on Foreign Relations through 1994*, Vol. II (Washington, D.C.: USGPO, July 1995) 1195.
8. *Legislation on Foreign Relations through 1994*, 1195.
9. *Treaty on the Non-Proliferation of Nuclear Weapons*, signed 9 July 1968 (Washington, D.C.: USGPO, 98-118) Article I, 2.
10. Miller, 108.

11. *Treaty on the Non-Proliferation of Nuclear Weapons*, Letter of Submittal to the U.S. Senate, vii.
12. Joseph S. Nye, Jr., "New Approaches to Nuclear Proliferation," *Science*, vol. 156, 29 May 1992: 1297.

Chapter 3

Historical Precedent

A close examination of U.S. behavior since the end of World War II reveals that although total nuclear non-proliferation has been the goal, and eventually an aspect of stated formal policy, the actions have been remarkably flexible and adaptive to meet the long-term interest in a stable international environment. Joseph Nye, dean of Harvard's Kennedy School of Government and former Assistant Secretary of Defense, makes the point that non-proliferation is only one aspect of United States foreign policy, and at times, our interests can be in competition or conflict.¹ In the fifty years of the nuclear age, the United States has treated each case of proliferation or potential proliferation on its own merits and place in total U.S. foreign policy. In this regard, U.S. foreign policy has been adaptive and flexible. The purpose for addressing historical examples of United States is to show that safety and security assistance has been done before, has been successful (in that there have been no accidental or inadvertent nuclear detonations), and is a feasible policy option.

UNITED KINGDOM: ASSISTANCE TO A FRIEND

During the World War II years of atomic bomb research and development, American and British scientists had an extremely close working relationship that reflected the United States' and United Kingdom's "special relationship." This changed dramatically in 1946 when President Truman signed into law a bill which transferred control of U.S. nuclear facilities and programs

from military to civilian control. The Atomic Energy Act of 1946 (McMahon Act) also greatly restricted the sharing of atomic secrets with any foreign power. British reaction was swift, as evidenced by a telegram sent by British Prime Minister Clement Attlee to President Truman on June 6, almost two months before Truman formally signed the bill into law. In the telegram, Attlee notes that not only did U.S. President Roosevelt initiate the joint effort of collaboration on the atomic bomb, but:

... we gave it [British assistance] in the confident belief that the experience and knowledge gained in America would be made freely available to us, just as we have made freely available to you the results of research ... where we were able to concentrate.²

While the McMahon Act was designed to preserve a U.S. government monopoly on the new atomic technology, British pressure, the Soviet development of an atomic bomb, and domestic and international pressures for commercial nuclear technology pushed the U.S. to amend the policy. President Eisenhower's "Atoms for Peace" speech in December 1953 and the revised Atomic Energy Act of 1954 were the result of these pressures. Additionally, a second amendment in 1958 permitted the transfer of "Restricted Data" to allies -- that is, information about nuclear weapons design and fabrication. This allowed extensive nuclear cooperation, and was followed shortly by the U.S.-UK Agreement for Cooperation on the uses of Atomic Energy for Mutual Defense Purposes. This agreement became the new basis for the special Anglo-American nuclear assistance relationship. Applications from this general agreement include:

- the extensive testing of British nuclear weapons in the United States.³
- strong evidence that the United States demonstrated Permissive Action Links (PAL), one of its new safety features, to the British who subsequently chose not to adopt this system.⁴

- indications that the U.S. supplied the British with submarine launched ballistic missile technology.
- consistent and continuing cooperation on the targeting of British nuclear weapons.

This special relationship and "pattern of existing cooperation" with the British was formally recognized by all parties to the START Treaty, which exempts the United Kingdom and the United States from limits to future nuclear related cooperation.⁵ While this policy option does not in any way advocate any assistance to further develop or enhance a new nuclear state's weapons, the British example illustrates how United States nuclear-related policy has been adaptive and flexible from its infancy.

THE SOVIET UNION: ASSISTANCE TO A FOE

While the rhetoric of Cold War hostility is still fresh in the minds of U.S. decision-makers, a look at the reality of the U.S.- USSR relationship from the end of World II to the fall of the Berlin Wall and the collapse of the Soviet Union shows periods of both conflict and cooperation. Shaken by the destruction that the two atomic bombs wreaked on Hiroshima and Nagasaki, and looking forward to the future of the international order, President Roosevelt's Secretary of War, Henry Stimson, believed that it was possible for the U.S. and USSR to reach an agreement that might check the spread of atomic weapons. With the help of his assistant secretary, John McCloy, Stimson sent a memorandum to President Truman with his thoughts on the future of the bomb, which was summarized by one historian:

The essence of Stimson and McCloy's approach was their belief that the United States did not possess real atomic secrets as such-only the American know - how needed to construct a bomb. Having abandoned any notion of using the bomb to transform Soviet society Stimson envisioned a "covenant" between the United States, Great Britain and the Soviet Union. The Soviet Union would halt efforts to develop its own atomic weapons, while the United States would make available information on atomic energy's peaceful application and would also undertake not to employ the atomic bomb or any development of it as an instrument of warfare.⁶

For both domestic and international political reasons, Stimson's vision of U.S.-Soviet nuclear cooperation did not come to fruition. Instead, as relations between the U.S. and USSR progressively deteriorated, the Soviet Union continued working at a frantic pace to develop its own atomic bomb. On 29 August 1949, the Soviets exploded their first atomic device and the initial instance of nuclear proliferation became reality.

Throughout the 1950's, both nations continued to develop their nuclear programs and arsenals. Although we know of no accidental nuclear weapons explosions during this time, both the U.S. and USSR went through a period of "nuclear adolescence" with many near catastrophes on both sides, some even today not fully explained or commonly known. President Kennedy was informed of more than 60 U.S. incidents,⁷ but these were only part of the problem. Within the USSR, Nikita Khrushchev himself once reportedly admitted that an erratic Soviet missile had to be destroyed in flight over Alaska.⁸ However, perhaps the closest thing to an accidental nuclear detonation occurred in September 1957, near Chelyabinsk in the Soviet Union. A chemical reaction in a tank containing radioactive waste caused a massive explosion that contaminated a large area. This contamination still causes radiation hazards nearly forty years later.⁹

The Cuban Missile Crisis

In October 1962, the Soviet's attempt to install nuclear capable ballistic missiles in Cuba resulted in the most serious American-Soviet crisis of the Cold War. The aftermath of the crisis and the subsequent U.S. effort to assist the Soviets in the security of their nuclear weapons provides an excellent example of an adaptive foreign policy stance and is worth quoting directly from an article by professor Dan Caldwell that appeared in *Survival* in 1987:

Curiously, despite the seriousness of the [Cuban missile] crisis, the Soviet Union failed to order a full alert of its missile forces. The Kennedy administration felt that one reason for the Soviet Union's failure to order a full alert was due to Soviet decision makers' lack of confidence in their command and control procedures. Consequently, President Kennedy and Secretary of Defense McNamara decided to make the Soviet leadership aware of the U.S. permissive-action link system, and on 19 December 1962, at an international arms-control symposium at the University of Michigan, one of McNamara's assistants, John McNaughton, delivered a speech in which he described, in general terms, the American PAL system. According to reports, U.S. scientists, also with the blessings of the Kennedy Administration, explained the American PAL system to Soviet scientists, who attended the 1963 Pugwash meeting in Dubrovnik, Yugoslavia. Apparently, members of the Kennedy administration believed centralized control over Soviet nuclear weapons by civilian authorities of the Soviet government was in the interest of both the Soviet Union and the United States.

Caldwell continues:

On several later occasions, the United States considered providing the Soviet Union with additional information about PAL ... the Committee on Nuclear Proliferation chaired by Robert Gilpatric concluded in 1965 that the United States should consider assistance to the United Kingdom, France, and the Soviet Union in connection with the development of (Deleted) and safety devices for their respective weapons. In an interview, a member of this committee recalled that consideration was given by the committee to providing PAL to other nuclear weapons states, so it is plausible that the deletion referred to PAL. The United

States was also prepared to provide the USSR with information about PAL in the negotiations that led to the "Accidents Measures" according to one of the U.S. negotiators, Sidney Graybeal. The Soviet representatives did not express interest, so the U.S. did not provide the Soviet Union with this information.¹⁰

Whether influenced by U.S. offers of information concerning these new Permissive Action Link safety measures or not, it appears that the Soviet Union developed and installed PAL on its theater nuclear weapons and analogous mechanical and electronic locks on strategic nuclear weapons to prevent unauthorized use.¹¹ Subsequently, writing in 1984 and 1986, the Commander-in-Chief of Soviet Strategic Rocket Forces, Marshall V.F. Tolubko, acknowledged that automated "PAL-like" functions are included into modern Soviet missile systems and that the Soviets had received the early information.¹²

Although the Soviet Union remained firmly in the category of foe, during the 1970's and 1980's, successive administrations made many diplomatic efforts to lessen the danger of nuclear confrontation, including the Strategic Arms Reduction Talks (START I, SALT I and SALT II) and the Anti-Ballistic Missile Treaty. However, with the dissolution of the Soviet Union in 1991 and the danger of formerly secure nuclear weapons and fissionable material spreading to rogue states, individuals or organizations, the U.S. Congress in 1992 enacted The Soviet Nuclear Threat Reduction Act, better known as the Nunn-Lugar Act. This legislation is designed to provide U.S. aid for denuclearizing and demilitarizing the former Soviet Union. The aid is to help Russia solve the problems of transporting, storing and dismantling nuclear weapons, including the purchase of special railway cars and armored blankets to ensure the safe transport of weapons, and for help in building a bombproof warehouse to store nuclear weapons.

components.¹³ As of late 1994, after taking into account the expiration of some transfer authority, there was a total of \$1.27 billion available for the Nunn-Lugar program from fiscal 1992 through 1995. The United States has so far reached agreement on 38 projects with Belarus, Kazakhstan, Russia and Ukraine. These projects are intended, among other things, to help with dismantling strategic and chemical weapons; protecting, controlling, and accounting for fissile material; providing new employment for former weapons scientists; and converting factories from defense work to civilian production.¹⁴

The history of adaptive, creative and flexible thinking by the United States in assisting the Soviet Union in the nuclear realm then includes the late 1940's initiative to share nuclear information, post-Cuban missile crisis disclosure of the United States PAL system, and 1990's aid under the Nunn-Lugar Act.

FRANCE: NEITHER A FOE, NOR ALWAYS A CLOSE FRIEND

The history of U. S. cooperation with France in the nuclear arena is neither as well known as cooperation with the United Kingdom nor as well documented as the assistance to the Soviet Union. The primary reasons for this seem to be the opposition of Presidents Kennedy and Johnson to nuclear collaboration with France, Charles de Gaulle's 1966 removal of France from NATO's integrated command structure, and domestic political concerns and opposition in each country.¹⁵

Although President Eisenhower saw no reason to keep from allies nuclear secrets the Soviets already knew, it took until the early 1970's and the Nixon administration to again open the door to cooperation with France. One senior official recalls Henry Kissinger telling him: "We're at a point where we want to turn a page with the French; we want to get better relations, and this is one way to do it."¹⁶ In 1973, Kissinger offered American assistance to French Foreign Minister Michel Jobert in the development of multiple warheads for submarine launched ballistic missiles. Jobert accepted, beginning a new era of French and U.S. cooperation. While each state was careful to acknowledge and work around legislative, policy, and internal political obstacles, the assistance and collaboration continued through successive U.S. administrations, addressing aspects of the French program: warhead miniaturization and electromagnetic hardening; safety and security; command and control technology; missile design, including guidance and propulsion systems; MIRV'ing; and targeting.¹⁷

As with U.S. assistance to the UK, each of these elements suggests assistance designed to enhance the total weapons system beyond the mere concern for safety and security. Again, this is not what is advocated in this paper. Our emphasis with this historical example is on the adaptive and flexible nature of this aspect of U.S. foreign policy, not on improving weapons design.

The recent French testing of nuclear weapons at its South Pacific test range has again put the spotlight on the French nuclear program and, with it, the past U.S.-French nuclear relationship. The U.S. and France are currently trying to negotiate an arrangement for further

collaboration in the sharing of sensitive computer codes and French participation in advanced experiments related to the study of aging nuclear weapons, one aspect of this being the issue of safety. The Clinton administration claims that maintaining a close United States-French relationship is essential to ensuring French support for the comprehensive test ban treaty to be signed in 1996. The assistance was provided with the proviso that the existence of the United States-French nuclear collaboration be made public, which it was in August 1995.¹⁸

ISRAEL: NUCLEAR AMBIGUITY AND OPAQUE PROLIFERATION¹⁹

The history of Israel's nuclear arsenal is not so much one of assistance as it is one of special circumstances. It is generally accepted that President Eisenhower's "Atoms for Peace" program unwittingly aided Israel's quest for nuclear weapons by training Israeli scientists at U.S. Atomic Energy Commission research centers and by constructing a small (5-megawatt) reactor for Israel. However, aside from journalist Tad Szulc's generally discredited charges that the U.S. helped Israel develop nuclear weapons,²⁰ the U.S.-Israeli nuclear relationship has been characterized by a degree of ambiguity that serves the interests of each state. This relationship, developed in the final months of the Eisenhower administration and during the Kennedy administration, is another excellent example of publicly espousing a policy of non-proliferation while recognizing that not all proliferation is equally ominous from the standpoint of U.S. interests. Israel's deliberately ambiguous stance on nuclear weapons and its unique relationship with the U.S., based on its geopolitical position and the burden of history, has permitted the U.S. to avoid making a decision between pressuring Israel to abandon its nuclear program or not

pressuring Israel, and thus exposing the hypocrisy of this position. Israel's opaque stance has facilitated the ability of the United States to overlook Israel's nuclear weapons capability while supporting the nuclear non-proliferation regime.²¹

PAKISTAN: THE TRUTH CHANGES

The purpose in addressing Pakistan is not to provide another example of U.S. assistance, but to illustrate the adaptive and flexible nature of United States foreign policy. Throughout the Cold War, Pakistan had been regarded by the United States as a staunch ally guarding part of the southern flank of the free world against Soviet expansion. Although President Zulfikar Ali Bhutto reportedly ordered the development of a Pakistani nuclear weapons program as early as 1972, the United States, for its own convenience, did not press Pakistan on the issue. The covert nature of the program made this easier, as did the inconclusive nature of the early work. Also, Pakistani cooperation with the U.S. concerns toward the Soviet Union, especially Pakistan's assistance to the Mujahadin fighting the Soviets in Afghanistan, mitigated U.S. pressure on the government of Pakistan. However, with the withdrawal of the Soviets from Afghanistan and the collapse of the Soviet Union as a threat to Persian Gulf oil, the situation changed. In spite of denials by the Pakistani government that it was developing nuclear weapons, President Bush was forced by the Pressler Amendment to cut off military and economic aid to Pakistan when he was unable to certify to Congress that Pakistan was not developing and did not possess nuclear weapons.

Total Non-Proliferation or an Adaptive and Flexible Policy?

Each of these cases clearly illustrates that U.S. policy toward a proliferating state can be influenced by many factors and that the variation in proliferation circumstances may require a different policy response in each. As Nye notes:

Policies for post proliferation will have to be tailored to the specific circumstances of interests and instruments in each region, while at the same time the effect on the global regime will have to be considered.²²

Chapter 3 Endnotes

1. Nye, "Diplomatic Measures," 77.
2. Clement Attlee, telegram to President Truman, 6 June 1946, *The Nuclear Age Reader*, ed. Jeffrey Porro (New York: Alfred A. Knopf, 1989) 129.
3. Martin Nevens, *Nuclear Weapons and British Strategic Planning, 1955-1958* (Oxford: Clarendon Press, 1991) 219-220.
4. Gregory, 29.
5. *Treaty with the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms (The START Treaty)* (Washington D.C.: USGPO, 1991) 728.
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7. Klein, 46.
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9. Douglas Pasternak, "Moscow's Dirty Nuclear Secrets," *U.S. News and World Report* 10 February 1992: 46; Gregory, 95-96; Thomas B. Cockran and Robert S. Norris, "A First Look at the Soviet Bomb Complex," *The Bulletin of the Atomic Scientist* May 1991: 26-29.
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11. Stephen M. Meyer, "Soviet Perspectives on the Paths to Nuclear War," *Hawks, Doves and Owls*, ed. Graham T. Allison, et al. (New York: W. W. Norton, 1985) 191.
12. Meyer, 191- 192.
13. Robin Knight, et al., "Easier Said Than Done," *U.S. News and World Report* 2 November 1992: 54.
14. Dunbar Lockwood, "Nunn-Lugar: Getting down to Business," *The Bulletin of the Atomic Scientists* January/February 1995: 12-13.
15. Richard H. Ullman, "The French Connection," *Foreign Policy*, no. 75, Summer 1989: 8.

16. Ullman, 8.

17. Ullman writes that Kissinger was mindful of the limitations imposed by U.S. legislation. Apparently, it was during Jobert's visit that a procedure that came to be known as "negative guidance" was first broached. Since U.S. law forbade the transfer of Restricted Data, when it came to questions actually involving the design of nuclear weapons, French experts would describe what they were actually thinking of doing and then the Americans would let them know, in general terms, whether they were on the right track. Thus the Americans could actually avoid mouthing Restricted Data. "Twenty Questions," the term by which many Americans referred to negative guidance, was necessary for only giving advice about the actual nuclear physics package, in the lingo of the designers. Technical assistance in regard to delivery systems for instance-was governed by policy rather than by legislative restraints. So was the sharing of intelligence data-for example, on Soviet antimissile defenses and on targets. Ullman, 9-10.

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20. Peter Pry, *Israelis Nuclear Arsenal* (Boulder Colorado: Westview Press, Inc., 1984) 9-10.

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22. Nye, "New Approaches to Nuclear Proliferation Policy," 29.

Chapter 4

Types of Nuclear Assistance

The development of a nuclear weapons program and eventual arsenal by each of the five major nuclear powers was extremely complex and expensive in terms of both money and human resources. While safety and security concerns have always been part of the total system, the reality is that they have often lagged behind the development of the weapons. The United States and the former Soviet Union had a long, gradual and often parallel "nuclear adolescence" where each learned by experience, trial and error to address the concerns of nuclear weapons safety and security. In addition, there are long-term environmental aspects of the development and use of highly enriched uranium and plutonium that are now being increasingly addressed, but have not been answered.

The objective of enhancing the safety and security of a new nuclear state's weapon(s) is simply stated as the prevention of accidents involving nuclear weapons and of their unauthorized use. Reflecting on the 50 years of the First and Second Nuclear Ages, it is clear that states have faced two distinct tradeoffs in the development and deployment of nuclear weapons: First, military readiness versus safety and security; and second, monetary cost versus safety and security. It is useful to keep these tradeoffs in mind when addressing the safety concerns illustrated by the following sample from Shaun Gregory's study of nuclear weapons accidents.¹

[On 13 November 1963, at Medina Base in Texas,] there was spontaneous combustion of 123,000 lbs. of high-explosive components of nuclear weapons. Limited contamination occurred, [and] 3 Atomic Energy Commission employees were injured ...

[On 17 December 1966,] a B-52 [bomber] and a KC-135 refuelling tanker collided in mid-air [near Palomares, Spain]. The B-52 crashed and four unarmed H-bombs were separated from the plane. One landed intact in a dry river bed. The second and third released radioactive material in the middle of a populated area. The fourth was retrieved from the ocean on 7 April [1967,] after an intensive search ... [Subsequently,] 1400 tons of contaminated soil and vegetation were removed to Texas. Over 20 years later there is still evidence of radioactive contamination in the soil around Palomares and of possible radiological injuries to some of the population ...

[On 21 December 1968,] a B-52 [bomber] taking part in the continuous airborne alert operation, "Chrome Dome," caught fire. It diverted to Thule, [Greenland,] but crashed 7 miles short of the runway ... 4 1.1-Mt [megaton] bombs were lost or destroyed by fire [and] significant radioactive contamination resulted ...²

In each of the above examples, it is thought that the detonation of the high explosive in the weapons in each case would not have occurred if the warheads had contained insensitive high explosive (IHE), instead of conventional HE, and could not have occurred had it been the practice not to allow nuclear weapons to be airborne in peacetime. Each of these is an example of the type of "lesson learned" during the early period of nuclear adolescence:³

[On 18 or 19 September 1980, at a launch silo near Damascus, Arkansas,] a workman accidentally dropped a socket wrench during maintenance, puncturing the side of a Titan missile and releasing fuel. After 8 hours the fuel contamination built up in the silo and exploded. One crewman who was inside the silo assessing the damage was killed. The explosion blew off the 740-ton silo door and hurled a 9-Mt warhead and lumps of concrete hundreds of yards. Later reports confirmed that there had been some contamination ...

[On 19 November 1980, near McConnell Air Force Base, Wichita, Kansas,] during a drill a [Titan] missile was apparently started on a real launch sequence. One of the launch crew shut the missile down (pulled the plug) to prevent the launch. Had the missile been launched, it was targeted on the USSR. The error had been caused by mistakes in maintenance.⁴

The United States is not the only nuclear power to have suffered accidents. A sample of incidents involving the former USSR (excluding the erratic missile incident and the 1957 Chelyabinsk explosion noted in Chapter 2) include:

[In January or February 1970,] a large explosion occurred [at the Gorki submarine works in the USSR]. The Volga River and its Black Sea estuary were later found to have been contaminated ...

[On 28 December 1984,] an unarmed cruise missile launched in the Barents Sea strayed into Norwegian airspace. It crashed or was shot down over Finland. It is possible that in some circumstances it might have been mistaken for part of a pre-emptive strike on Germany.⁵

A series of explosions on 13-18 May 1984 at Severomorsk Naval Base on the USSR's Kola Peninsula are believed to have destroyed much of the missile stocks of the Soviet Northern Fleet.

In addition to these noted incidents, there was a series of accidents and fires involving Soviet nuclear armed or nuclear powered submarines too extensive to list.

The purpose of highlighting the "safety" incidents is not to be an alarmist, but rather to illustrate the growth process the U.S. (and USSR) underwent as a preliminary to noting safety

measures that have been developed and could be shared with a new nuclear state to mitigate against their experiencing similar accidents.

To assist in understanding safety measures it is useful to separate them into physical and procedural. This discussion serves to show how far the United States has come in the development of safety and security measures and procedures, and what could be done to assist a new nuclear state without providing an improved offensive capability.

Physical Safety Measures

Component Separation is the most obvious and initial safety measure and consists of keeping weapons dismantled and in component parts, assembling them only when required for use. This safety measure clearly illustrates the tradeoff in readiness versus safety, although there is strong evidence that at least Israel and India practice it today.⁶

One-point Safety is a method that works by ensuring that only one point of the high explosive element of a nuclear weapon will initially detonate in an accident as a conventional explosion, rather than the whole high explosive element exploding simultaneously to produce a nuclear detonation. One-point safety insures that in the event of a serious accident the nuclear weapon's fissile core is blown apart rather than detonated.

Environmental Sensing Devices (ESD's) use the specific physical features of the means of delivery of a weapon to provide a measure of safety. Nuclear weapons falling from an aircraft, for example, experience close to-zero-gravity (free-fall) and subsequent rapid deceleration if a parachute is used to arrest the fall of the weapon. Similarly, a nuclear artillery shell fired from a gun or howitzer will spin to arm the weapon on its way to the target, although this is probably a more advanced weapon than a new nuclear state would initially develop. ESD's are physical measures incorporated into weapons to block critical electrical circuits, thereby keeping the weapon unarmed, until the weapon has experienced the correct environmental conditions. Once protected by ESD's, weapons involved in accidents that did not duplicate the means of their intended use would act to prevent nuclear detonation.⁷

Fire Resistant Pits (FRP) are another physical measure, albeit a simple one, used to prevent the spread of molten or gaseous fissile material in the event of fire.⁸

Insensitive High Explosive (IHE) is a new type of explosive that is far less sensitive to abnormal environments than the explosives usually used in nuclear weapons. However, they are still an efficient initiator of a nuclear detonation under the right circumstances. IHE afford nuclear weapons a high degree of protection against detonation from accidents such as aircraft crashes, fire, inadvertent release from aircraft, sympathetic detonation from other explosions, and small arms strike.⁹

Enhanced Nuclear Detonation Safety System (ENDS) is the most advanced of the known physical safety measures. Weak links, specially manufactured circuits designed to fail in an accident, are incorporated into the electrical arming and fusing mechanisms.¹⁰ Should any of these "special" links fail, the weapon will not detonate.

Procedural Safety Measures

Procedural safety measures primarily address the handling, storage and transport of nuclear weapons and the training of people who work with them. The United States has developed elaborate measures that sometimes overlap with physical safety concerns. U.S. experience has shown that most accidents occur during transport, and that of these, the vast number are caused by human error. While many procedural safety measures may seem obvious and self evident, they are not necessarily so to a new nuclear state. These safety measures include:

Handling. A minimum of two secure points are required for stability and ease of handling whenever a weapon is lifted or moved. In addition, any transport device must be certified as safe to move the weight of the weapon. These secure points assist movement and mitigate against damaging the weapon.

Storage. The storage environment must be controlled for humidity and temperature, provide for grounding from electrical strikes (lightning), and provide protection from electromagnetic radiation.

Transport. Since as previously noted, most accidents occur during air movement, aircraft transport should be avoided unless absolutely necessary. Motor vehicle transport should be in environmentally safe vehicles with the necessary security and back-up (fast response) emergency teams.

Training and Education. Training on elements of nuclear weapons safety is critical for people who both work with and guard nuclear weapons.

Each of the listed physical and procedural safety measures may not be appropriate to a new nuclear state either because of the relative simplicity of their weapon or because of conscious tradeoffs in cost or readiness. However, each case of new proliferation warrants a close examination of which measures and assistance would be most acceptable and appropriate. We should also stress that this type of assistance does not include any overt attempt to gain access to a state's nuclear weapons program.

Security: Preventing Unauthorized Use

The security of nuclear weapons most commonly refers to the prevention of unauthorized

use of a system, both warhead and transport system whether bomb, shell or missile or an individual warhead or warheads. In the future, it may also increasingly apply to the security of weapons grade uranium and plutonium, as applicable to former Soviet states under the Nunn-Lugar Act. A few examples are again useful to illustrate past problems:

A dramatic incident that occurred in 1960 suggests that French decision makers may very well perceive a real need for PAL. In May 1958, Charles de Gaulle was elected President of France largely on the issue of Algeria. de Gaulle proclaimed a policy of self-determination for Algeria in September 1959, and was bitterly opposed by the hierarchy of the French military. When the generals attempted to overthrow de Gaulle in 1960, the French government ordered the detonation of one of its test weapons in Algeria so that it would not fall into the hands of the generals ...¹¹

Given the turbulent history of the Peoples Republic of China during the past three decades, Chinese leaders have good reason to be concerned about nuclear weapons control. One incident in particular illustrates the magnitude of the nuclear weapons control problem facing the Chinese leadership. In 1971, Lin Biao, who was then the Defense Minister, attempted to overthrow Mao Zedong. Following the unsuccessful coup d'etat, Lin's plane was reportedly shot down as it headed for the Soviet Union. This incident reportedly raised the question of civilian control over the military in the minds of Chinese leaders.¹²

[The former Soviet Union:] Stolen atomic material from eastern Europe has already been seized by police in Germany. No inventory of Russian warheads has yet been drawn up and already some may be missing. There are numerous reports - repeatedly denied by the Russians and unconfirmed by American authorities - that Iran has obtained four nuclear weapons from former Soviet Central Asian Republics including two 40 - kiloton missile warheads.¹³ [In spite of these reports,] Mithail Yegorov, who heads the Russian governments organized crime department, has insisted that security remains tight at nuclear installations and that most of the attempted thefts ... would not be well guarded weapons, but enriched radioactive materials that could be used to build a bomb.¹⁴

The security measures involved with nuclear weapons and weapons grade uranium and

plutonium are (like safety measures) best understood by separating them into physical and procedural, although the overlap is extensive.

Physical Security Measures

The simplest and most obvious physical security measure is storage facilities with multiple layers of security. Both the U.S. and the former USSR developed a multiple layered security system composed of remote facilities with dual fencing, sensors, patrols, alarms, and reaction forces; dual locks and coded doors on storage facilities; decoy storage facilities and warheads; and command disable and tamper-proof mechanisms in the warheads.

At the direction of President Kennedy, the United States developed relatively simple PAL systems in the early 1960's to enhance the security of its weapons. These were simple electromechanical combination locks designed to safeguard weapons against actions by an individual psychotic, meet the legal and political requirements of U.S. control, maintain control against the unauthorized use of weapons by our own or allied military force under conditions of high tension or actual military combat, and assure that weapons could not be used if forcibly seized by an organized group of individuals or by a foreign power.¹⁵ In the early PAL system, when the correct numerical code was fed into the PAL device, the electrical circuit of the nuclear weapon was completed and the weapon could be detonated, assuming that the other safety (and security) features were followed.¹⁶

Procedural Security Measures

Two-Person Rule ensures that any decision, procedure, or process involving nuclear weapons must be carried out by at least two individuals. It is intended to safeguard against the actions of unstable or irrational people by ensuring that no nuclear weapons operations are undertaken by lone individuals.¹⁷

Personnel Reliability Program (PRP) is another measure which is common to both the security and safety aspects of nuclear weapons is a system for attempting to guarantee the safe and reliable behavior of all people who have access to any aspects of a nuclear weapons program. To screen or vet unstable, undesirable or unreliable individuals from duties that involve nuclear weapons, the United States developed a Personnel Reliability Program (PRP) and all personnel were submitted to it. The screening and vetting includes consideration of personal information, medical and psychological background, technical competence, attitude, and security worthiness.¹⁸ The intention is to employ only " ... those personnel who have demonstrated unswerving loyalty, integrity, trustworthiness and discretion of the highest order ... to ensure that such weapons are not subject to loss, theft, sabotage, unauthorized use, unauthorized destruction, accidental damage or jettison."¹⁹

In conclusion, although many of these measures seem self-evident, they were developed only after years of use, experiment, and trial and error. All the security measures would be extremely difficult for a new nuclear state to implement immediately. As with the safety

measures, they must be selected and tailored to meet the specific circumstances of each case of assistance. Each of these measures, especially the early versions, could be passed to the nuclear state with no loss or compromise of sensitive U.S. information. An in-depth and detailed analysis of both the measures and the benefit versus the cost will be necessary before proceeding with any form of safety or security assistance.

Chapter 4 Endnotes

1. Most of the information for the noted nuclear weapons accidents is extracted from: Shaun Gregory, *The Hidden Cost of Deterrence, Nuclear Weapons and Accidents*, 177-194.
2. Gregory, 159, 161, 164.
3. Ray E. Kidder, "Safety No Barrier to Test Ban," *The Bulletin of the Atomic Scientists* April 1991: 32.
4. Gregory, 179.
5. Gregory, 185, 189.
6. Both Gregory and Miller have excellent discussions on the safety and security aspects of nuclear weapons and the following discussion borrows heavily from them.
7. Gregory, 19.
8. Miller, 116.
9. Miller, 116; and Gregory, 19.
10. Miller, 116; and Sidney D. Drell, "How Safe Is Safe?" *The Bulletin of the Atomic Scientists* April 1991: 36.
11. Caldwell, 228.
12. Caldwell, 231.
13. Robin Night, 54.
14. Jeff Trimble, "Nuclear Mafia," *U.S. News & World Report* 6 June 1994: 17.
15. Jerome B. Wiesner, "Memorandum For The President," U.S. government documents, no copyright, 22 November 1993.
16. Caldwell, 227-228.
17. Gregory, 18.
18. Gregory, 20.

19. Herbert L. Abrams, *Sources of Human Instability in the Handling of Nuclear Weapons*, monograph reprint (Stanford, CA: Stanford University Press, 1986) 510; and Gregory, 20.

Chapter 5

The Nuclear Assistance Model

This chapter proposes that the Nunn-Lugar (Cooperative Threat Reduction) program which was designed to aid inheritor nuclear states, can be expressed as a conceptual model to provide a framework for providing cooperative assistance to new nuclear states - a totally separate category of proliferants.

The purpose for this review of Nunn-Lugar, and specifically the U.S. Fissile Material Protection, Control and Accounting (MPC&A) element of the Nunn-Lugar program, is twofold: First, to demonstrate how far the U.S. has already come in providing nuclear assistance to a former adversary; and second, to develop a conceptual model from the elements of the Nunn-Lugar program that can be used to demonstrate how assistance might be provided to new nuclear states. A principal advantage of this approach, when carefully used, is that it can facilitate application of the relevant logic and rationale of providing assistance to the nuclear states of the former Soviet Union (a logic and rationale currently endorsed by both the administration and some in Congress) to a separate category of current, emerging or future nuclear states. In addition, as will soon become clear, it serves to reduce traditional resistance to the concept of providing assistance to new nuclear states by clarifying the distinction between *position* and *interest*.¹ This approach also establishes and underscores parallel relationships between separate programs supporting a common goal (nuclear safety), and it demonstrates the common national

interest objective (reducing the nuclear threat) of these programs. Another advantage is that this approach identifies the differences between the inheritor nuclear state and the new nuclear state programs (and their respective program goals), differences that require new decisions and policy determinations. Finally, this approach provides an opportunity to capitalize on relevant lessons learned from the Nunn-Lugar program by applying them to the development of the cooperative strategies program proposed here.

Based on the arguments and precedents set forth earlier in the paper, this chapter assumes that providing safety and security assistance is a desirable thing to do; that providing assistance can reduce the risks of a nuclear explosion, and that this is in the U.S. national interest. Understanding this, the focus will be on the mechanics of the program, not specific potential recipients, past bilateral relationships, or associated controversies.

This chapter will first briefly review the principal goals, components, and problems associated with the Nunn-Lugar program. This review of a current assistance program to a long-standing former adversary will demonstrate that assistance to new nuclear states can more appropriately be viewed as a cousin of an existing program than as a radical new idea. Next, a basic conceptual model for providing nuclear safety and security assistance will be developed from the principal elements of the Nunn-Lugar program. The basic model will then be used to explain in a straightforward way the key elements of the current U.S. policy of providing assistance to the states of the former Soviet Union. Finally, the Nunn-Lugar elements in the

model will be replaced with proposed elements of cooperative strategies to demonstrate how the conceptual model works for new nuclear states.

This development of the Cooperative Strategies Model strives to overcome the traditional resistance to providing technical assistance to new nuclear nations by demonstrating how, based on what has been identified as in the national interest, a program of safety and security assistance to new nuclear nations can be developed by the administration from an existing program. This concept can receive broader support in Congress and from the American public by demonstrating how much progress has already been made in this area, and how this program shares common framework and logic with a current U.S. policy.

BACKGROUND: NUNN-LUGAR GOALS AND COMPONENTS

The collapse of the USSR in the early 1990's generated concern in the U.S. for the physical security of nuclear weapons located throughout the newly independent states of the former Soviet Union. Isolated reports of fissile material later found outside the borders of the FSU compounded this concern. The Nunn-Lugar assistance program was developed to improve the physical security, control and accountability of fissile materials in the FSU in order to reduce the risks associated with this nuclear leakage. Under the Nunn-Lugar assistance program, the U.S. is providing assistance for dismantling nuclear weapons and reducing the broad spectrum of dangers associated with nuclear weapons and fissile material transportation and storage in the

FSU. According to Senator Nunn, the program has several broad purposes: first, consolidation of weapons of mass destruction in safe areas away from areas of conflict; second, careful inventory and accountability of these weapons; third, safe handling of nuclear weapons at a time of considerable domestic turmoil in the FSU; fourth, safe disposition of these weapons, as called for by arms control agreements and also by common sense; and fifth, assistance in gainfully employing thousands of former Soviet scientists who know how to make weapons of mass destruction.²

The current U.S. nuclear assistance effort to the states of the former Soviet Union consists of several components.³ One principal component is the "Government-to-Government" effort, known as Nunn-Lugar [and alternatively called the Department of Defense's (DOD's) Cooperative Threat Reduction (CTR) program.] This program is responsible for administering funds provided under the Soviet Threat Reduction Act of 1991 (P.L. 102-228) and subsequent congressional appropriations. The U.S. Fissile Material Protection, Control and Accounting program for the FSU is a key element of the Nunn-Lugar program. A second component of the U.S. nuclear assistance effort is the "Lab-to-Lab" effort. This is a program of cooperation among U.S. and Russian nuclear laboratories, administered by the Department of Energy (DOE) and called the Laboratory-to-Laboratory Nuclear Materials Protection, Control, and Accounting Program. There is also the "DOE-GAN" effort which consists of Nuclear Regulatory Commission (NRC) cooperation with Gosatomnadzor (GAN) on development of a safeguards infrastructure for Russia. A final component is the "Warhead Security" effort, a program developed to deal with excess nuclear weapons which focuses on transportation security and

storage security, and is administered by DOD. These U.S. nuclear assistance effort components have been adjusted somewhat as the Nunn-Lugar program has evolved.

In the Conference Report on the FY 95 Defense Authorization Act, Congress has directed continued assistance to improve fissile material control in Russia. Assistance programs developed in support of the Nunn-Lugar effort have begun to chart new ground in nuclear inspection and restricted data sharing between the U.S. and the FSU. This extensive level of cooperation is underscored by recent transparency programs dealing with nuclear weapons complexes where agreement has been reached between the U.S. and Russia to mutually verify their nuclear weapon dismantlement by instituting an international arrangement to protect and monitor the nuclear material from the dismantled weapons.⁴ By the end of 1996, the United States expects to be able to provide the resources to establish MPC&A cooperation at all Russian nuclear materials sites, including those in the nuclear weapons complexes and at civilian and naval propulsion reactors.⁵ This is an unprecedented level of assistance to the nuclear arsenals of a former adversary, and warrants close monitoring so as not to devolve to a point where reciprocal rights are extended.

Yet, this level of authorized cooperation has already led to some far-ranging proposals. Thomas Cochran, appearing before the President's Commission for Advisors on Science and Technology, recommended that Presidents Clinton and Yeltsin direct the national laboratories to "... jointly research, develop, and demonstrate, on a bilateral basis, a monitoring and safeguarding regime that covers *all nuclear weapons and weapon-usable fissile materials* in the

weapon states.⁶ Cochran suggests that this expanded mission should provide for complete reciprocity - equal access to each other's facilities, and that it would require the cooperation of the U.S. Navy. The Navy, which traditionally has not been covered by such agreements, could not exclude coverage on the basis that its materials or facilities are too sensitive.⁷ William Potter, Director of the Nonproliferation Center at the Monterey Institute, has suggested that part of the U.S. long-term strategy to contain fissile material proliferation should be to seek to create a safeguards regime that extends to all nuclear weapon-usable material in the nuclear weapon states.⁸ This paper does not advocate such far-ranging reciprocal safeguard proposals which could adversely impact DOD. The purpose of safety and security assistance is solely to make safe and secure "at-risk" nuclear programs.

The U.S. MPC&A effort is an ambitious attempt to address a real threat to U.S. national security interests. That we have come so far in providing assistance to our former enemy is astounding. Programs that would have been aggressively attacked just a few years ago are in place and reasonably productive. To varying degrees these programs enjoy the support of the Administration, some in Congress and the American people.⁹ Past positions of suspicion and hostility have been suppressed in favor of a combined effort in support of a common interest. Controversies of providing assistance to Russia aside, it is hard to argue against the logic of providing assistance to reduce the threat of loose nuclear material.

The mixed success of Nunn-Lugar also reminds us that there are many problems associated with new programs. Clearly institutional resistance presents a serious obstacle for

program success. Managerial deficiencies frustrate progress. Funding restrictions can jeopardize the project. And equally important, program development takes years, years during which support might lag behind recognition of the program's importance and value; years which the threat may not permit us once it has emerged. Despite its critical importance, and time sensitivity, the U.S. MPC&A assistance program has suffered such problems.¹⁰ A summary of these shortcomings, which mainly involve procedures and perceptual matters, and recommended solutions are provided in Appendix A. These program solutions or "lessons learned" must be built into any new framework developed for providing assistance to new nuclear nations.

Legitimate security concerns are certain to arise when dealing with such a sensitive issue. Cochran's and Potter's proposals noted earlier fall into this category. However, assistance program opponents may use concerns for security as roadblocks to legitimate progress, and as justification for their opposition. Program supporters, while protecting critical technologies and secrets, should view security concerns as challenges to be met with innovation. As has been demonstrated in the past, imagination and initiative often can provide the solution to such challenges without jeopardizing security interests.¹¹ Whether proposing assistance to inheritor states or new nuclear states, no one is advocating abandoning U.S. interests, or sacrificing U.S. security, but instead, reevaluating past positions and suggesting new, innovative ways of guaranteeing our interests far into the future. The challenge presented is that of abandoning old Cold War positions in favor of a common interest, while continuing to support legitimate and current security concerns.

Understanding the depth of Nunn-Lugar, the challenges it has surpassed; understanding the organizational challenges inherent in new programs; and understanding the need for clear funding paths all contribute to developing the foundation for the "how" of providing assistance to new nuclear states. The purpose here is not to provide practical advice on how to solve the "ubiquitous problems of political and bureaucratic opposition," but only to note their negative effects on any new program in order to anticipate them.

With the program elements and shortcomings identified, development of the conceptual assistance model can now proceed. Following the explanation of the basic model, two illustrations of how it can be applied are provided - first, using elements from the Nunn-Lugar effort, and then using more general concepts to suggest how assistance might be provided to new nuclear states.

THE BASIC MODEL:

The following paragraphs develop the concepts of assistance categories, elements of assistance, and specific assistance programs. The Nunn-Lugar programs aimed at reducing the nuclear leakage threat can be grouped into three broad categories.¹² These categories in turn form the cornerstones of the basic conceptual model for nuclear assistance. In general terms, Nunn-Lugar assistance can be divided into three assistance categories: assistance to improve security; aid to halt accumulation/facilitate disposal; and bilateral cooperation to facilitate

relationship building. Specific elements of assistance are materials, technologies, or services, such as anti-theft devices, that contribute to the objectives of an assistance category, in this case, improving security. Programs are represented in the model by the legs of the triangle which connect the equipment or technology to be provided with program elements that serve to build and strengthen the bilateral relationship between the U.S. and FSU thus increasing the transparency of the Russian nuclear complex. Figure 5.1 represents these three categories.

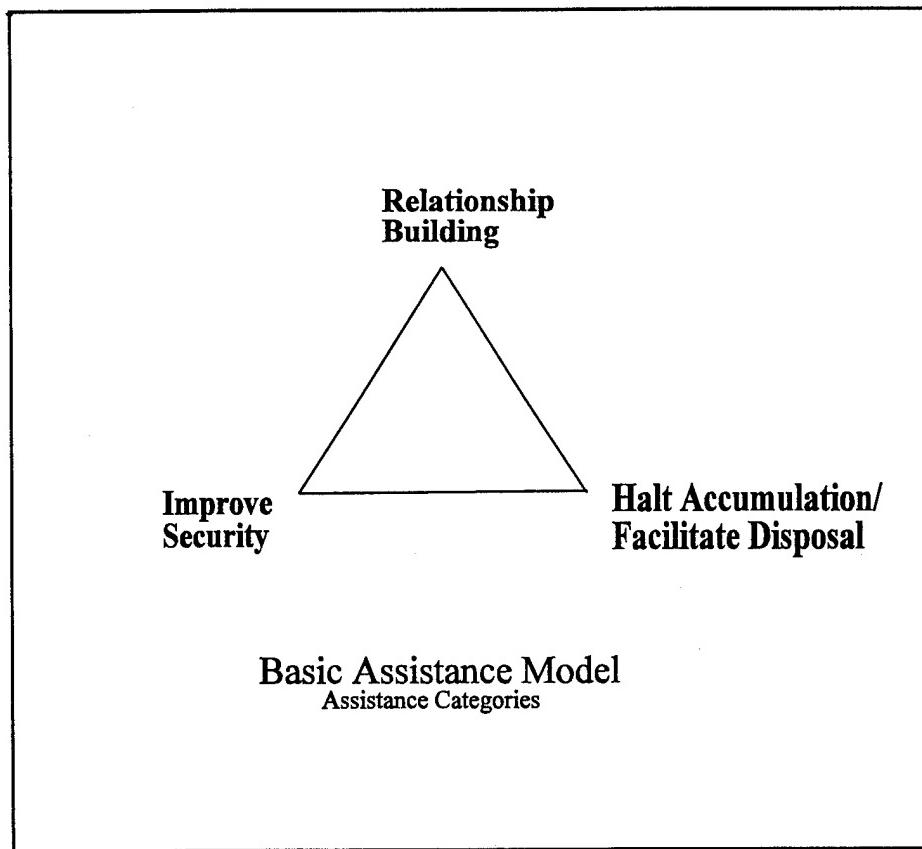


Figure 5.1

Any program between partners has two principal components: the bilateral relationship between the parties to the program and the substance of the program itself. Often a relationship

of mistrust or suspicion can inject problems into the program that are contrary to the parties mutual interests. This model separates the relationship from the substance so that each can be addressed separately.

As the title suggests, the "Relationship Building" category of the model focuses on the relationship between the partners. Elements that comprise relationship building include increasing transparency,¹³ confidence building, improving communication, improving understanding, and education. Building relationships between partners requires a "prolonged period of socialization."¹⁴ The remaining two points of the model triangle address program substance. Program categories key to reducing the threat from nuclear weapons are improving security and halting accumulation (and ultimately facilitating disposal) of weapons and fissile material.

Improving security specifically refers to those actions that can be taken to improve the physical security and safety of nuclear weapons. It also addresses horizontal proliferation concerns in that this category includes those elements and objectives designed to thwart illegal nuclear weapons and fissile material proliferation between states. Therefore, programs in this category would support anti-theft and anti-smuggling measures, in addition to assistance to improve nuclear weapons safety. Assistance to improve export controls and cooperation to facilitate the creation of sound nuclear regulatory regimes are also included in this category.

The Halt Accumulation/Facilitate Disposal category addresses vertical proliferation concerns, and those dealing with nuclear weapons stockpile reduction. Taken together, the basic assistance model addresses the issues of security, stockpile and the relationship between the countries.

To illustrate the conceptual assistance model, its function will first be demonstrated with Nunn-Lugar assistance elements or objectives. Later these elements will be replaced with elements tailored to providing assistance to new nuclear nations.

The Nunn-Lugar CTR Model

Improving Security

Current efforts to improve security of FSU fissile material cover the elements of improving fissile material MPC&A (most of the leakage of fissile material can be attributed to failures of the Russian MPC&A system), increasing warhead safety and security, stopping the "brain drain" of Russian scientists and nuclear technicians, improving export controls, facilitating sound nuclear regulatory regime creation, improving anti-theft, and anti-smuggling enforcement.¹⁵

Halting Accumulation/Facilitating Disposal, Facilitating Defense Conversion

Halting the accumulation of nuclear weapons and efforts to facilitate disposal of fissile material have primarily been focused on facilitating the disassembly of FSU nuclear weapons,

enhancing transportation safety and security measures, expanding and modernizing warhead and fissile material storage facilities, and expanding and accelerating U.S. purchase of Russian highly enriched uranium (HEU).¹⁶ In the case of Nunn-Lugar, it also includes defense conversion concerns such as nuclear scientist and technician employment, training, and support; and infrastructure realignment within a state.

Relationship Building

The third point of the Nunn-Lugar assistance model addresses the concept of relationship building, particularly as it applies to increasing transparency of Russian nuclear complex. It includes such elements as confidence building measures, joint nuclear technology development, inventory and site security analysis, financing joint development projects, and undertaking joint environmental clean-up. A key focus of this relationship building effort should be to develop what Potter calls the "underdeveloped physical protection culture" in the former Soviet Union, for which a sustained education and training effort is required. Figure 5.2 organizes these concepts.

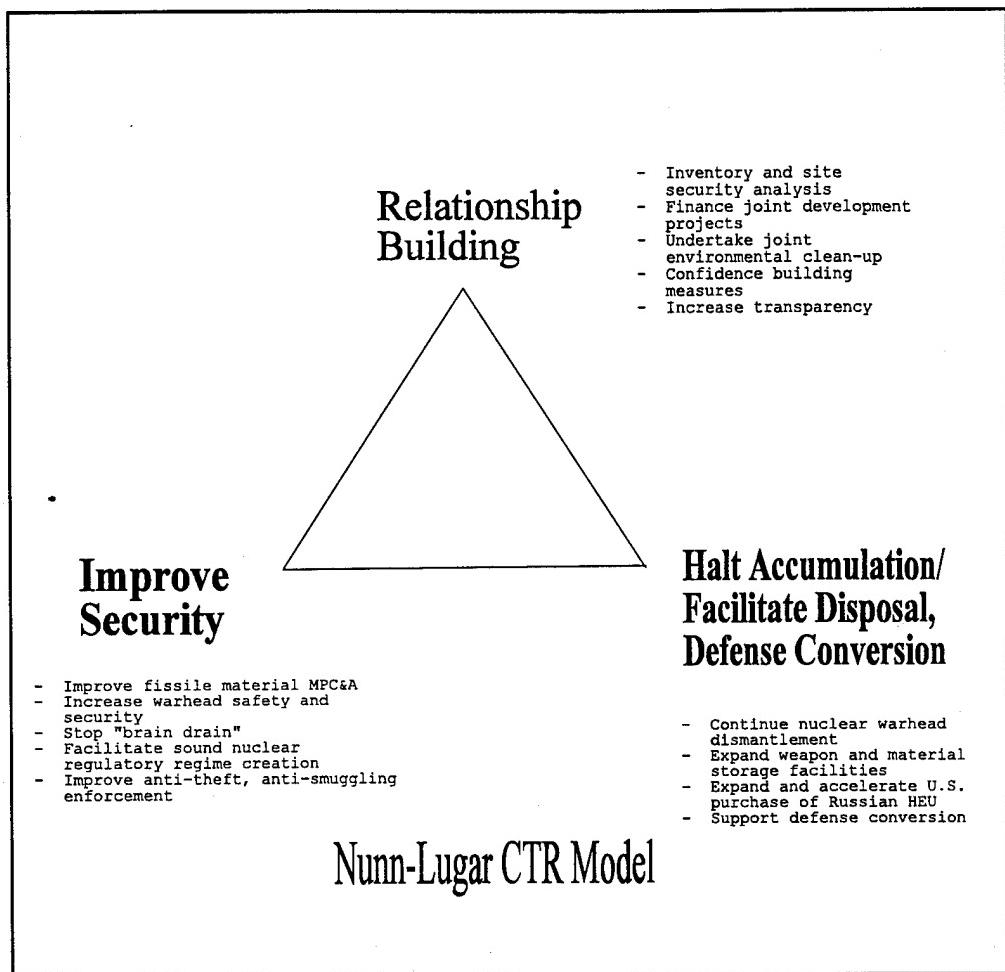


Figure 5.2

Again, when considering specific programs to address the threat, it is helpful to think in terms of the legs of the triangle. Balanced programs should address both the relationship and the substance. Programs that increase security and facilitate a more constructive relationship include: long term program management development, establishment of an international plutonium bank,¹⁷ establishment of a nuclear INTERPOL,¹⁸ and FREEDOM Support Act of 1992 (P.L. 102-511).¹⁹ Programs specifically addressing the nuclear stockpile and defense conversion

include: International Science and Technology Center development (ISTC), U.S.-Russian HEU Purchase Agreement, Plutonium Purchase Program, Security Enhancement Program, Joint Nuclear Inventory and Site-by-Site Security Analysis Program, Laboratory-Industry Partnership Program (LIPP),²⁰ Defense Conversion/Industrial Partnership, and Strategic Offensive Arms Elimination.²¹ Not surprisingly, some programs span all three categories. These programs are depicted in figure 5.3.

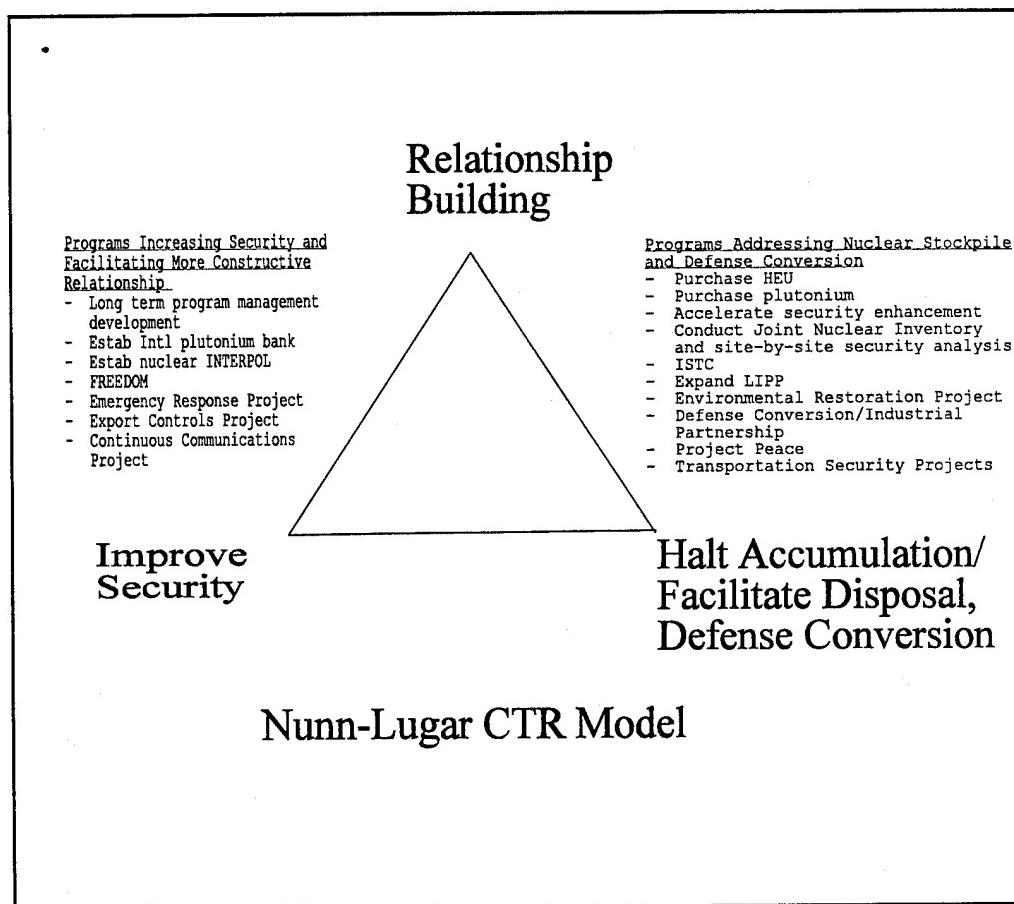


Figure 5.3

The next section, by substituting elements of assistance to new nuclear states into the basic model, will examine cooperation and technical assistance to secure nuclear weapons and

weapon-usable fissile materials in new nuclear weapons states, but not on the basis of a reciprocal intrusive safeguards regime.

THE COOPERATIVE STRATEGIES MODEL

The cooperative strategies model illustrates possible actions to take to reduce the risk of nuclear devastation originating from a new nuclear state. It also suggests how programs might be structured to address this threat. As the immediate concern associated with the new nuclear state is the high risk of nuclear inadvertence, the assistance categories in this model have been modified to reflect this threat. Figure 5.4 introduces the Cooperative Strategies Model.

Improving Safety

Efforts to improve security of nuclear weapons might address such elements as: increasing warhead safety, facilitating a sound nuclear weapon storage and transportation system, and conducting inventory and site security analysis.

Improving Security

Cooperative strategy elements to improve the security of the new nuclear weapons complex might include: improving anti-theft procedures, and anti-smuggling enforcement.

Relationship Building

Cooperative strategy elements to build confidence, increase transparency and develop the relationship might include: reciprocal visits and exchanges, joint strategic dialogue, financing joint development projects, and undertaking joint environmental clean-up projects. These program element are depicted in figure 5.4.

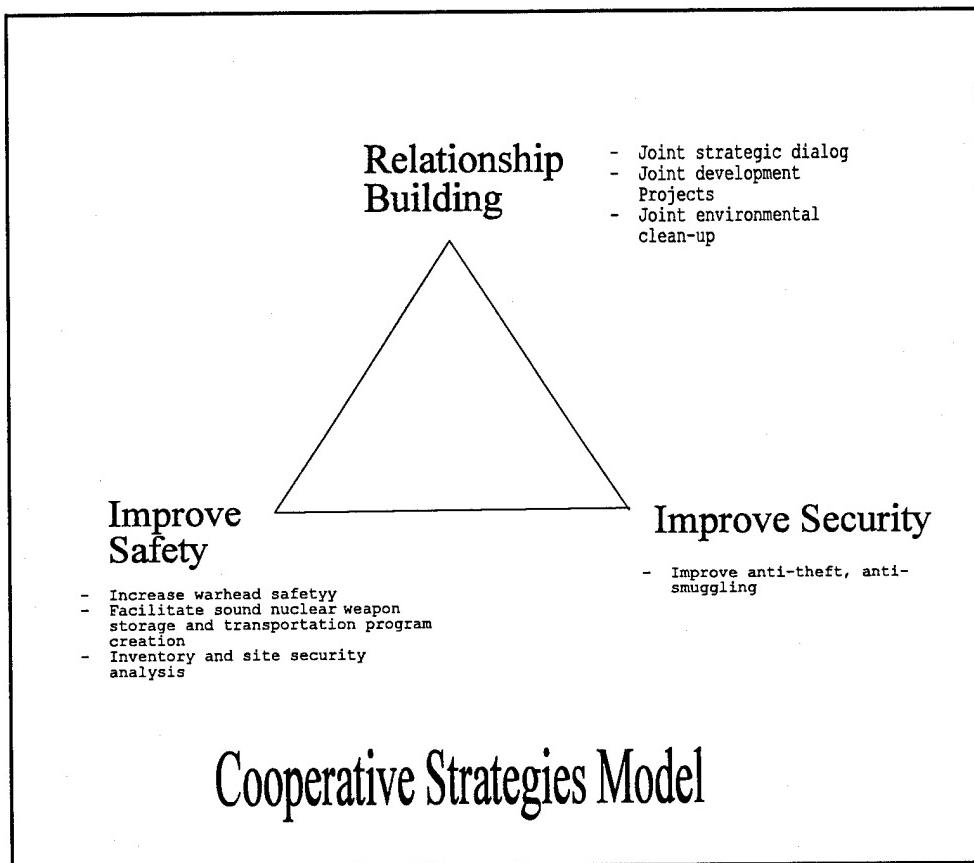


Figure 5.4

A program that might contribute to improved nuclear stability and a more constructive bilateral relationship with the new nuclear state might include: Joint Military-to-Military Talks, Joint Nuclear Inventory and Site-by-Site Security Analysis Program, Hardware Improvement

Program (ESD's, PAL's, physical security equipment, remote detection equipment, computers for accounting) and a Software Improvement Program (providing technical manuals, computer inventory software). Together such programs would dramatically reduce the risk of a nuclear disaster in the new nuclear state. These programs are depicted in figure 5.5.

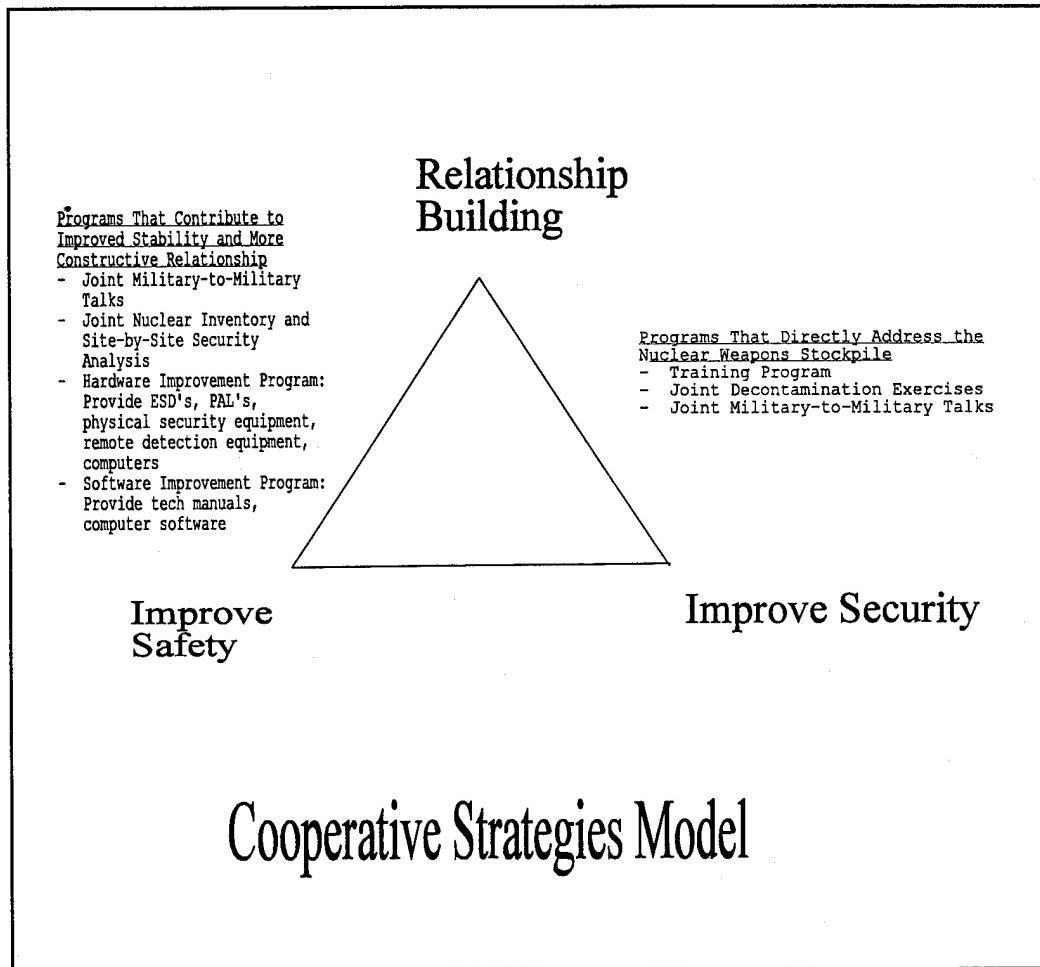


Figure 5.5

The Cooperative Strategies Model can be used as a tool for developing specific safety and security assistance programs should a policy of assistance be determined appropriate for a new nuclear state.

Chapter 5 Endnotes

1. For a discussion of the strategy of separating position and interest to facilitate negotiations and creating value; see Fisher and Ury, *Getting to Yes: Negotiating Agreement Without Giving In* (Boston: Houghton Mifflin, 1981) Chapter 3.
2. Nunn Sam. Based on remarks delivered by Senator Nunn in a keynote address delivered to the conference, The Nunn-Lugar Cooperative Threat Reduction Program: Donor and Recipient Country Perspectives, August 20-22, 1995, at the Monterey Institute of International Studies, Monterey, California.
3. Various authors have developed slightly different categories for describing the principal elements of the program. Our categories, while representative of many authors', were specifically derived from: Thomas B. Cochran, *U.S. Assistance to Improve Physical Security and Accounting of Fissile Materials in Russia*, unpublished remarks at the Carnegie Endowment for International Peace Conference on Nuclear Non-Proliferation in 1995: Renewal, Transition, or Decline? 31 January 1995. An earlier version of this paper, co-authored with Christopher E. Paine, was presented to the Panel on U.S.-Russian Cooperation to Control and Account for Fissile Material, President's Commission for Advisors on Science and Technology, Washington, D.C., January 27, 1995; also see Jessica Eve Stern, "Nunn-Lugar Activities to Improve Fissile Material Protection, Control, and Accountability in the Former Soviet Union," Unpublished paper (draft: 17 January 1996) presented at the conference, *The Nunn-Lugar Cooperative Threat Reduction Program: Donor and Recipient Country Perspectives*, August 20-22, 1995, at the Monterey Institute of International Studies, Monterey, California.
4. U.S. Congress, Office of Technology Assessment, *Proliferation of the Former Soviet Union*, OTA-ISS-605 (Washington, DC: USGPO, September 1994) 3.
5. William C. Potter, "Before the Deluge? Assessing the Threat of Nuclear Leakage From the Post-Soviet States," *Arms Control Today* October 1995: 15.
6. Cochran, 9.
7. Cochran, 9.
8. Potter, 16.
9. It is widely recognized, however, that support for these programs is eroding. Potter and Shields warn that the erosion of the broad consensus of support for the CTR program is being matched by a growing anti-Western sentiment in the Russian parliament, in William C. Potter and John M. Shields, "Cooperative Assistance with Former Soviet States: Lessons Learned and Directions for the Future," *The Nunn-Lugar Cooperative Threat Reduction Program: Donor and*

Recipient Country Perspectives, draft: 17 January 1996 presented August 20-22, 1995, at the Monterey Institute of International Studies, Monterey, California: 1.

10. Cochran, 1-6.
11. Michael R. Gordon, "Pentagon Offers New Way to Verify Disarmament," *New York Times* 10 March 1994, A6.
12. Graham T. Allison, et al., *Avoiding Nuclear Anarchy. Containing the Threat of Loose Russian Nuclear Weapons and fissile Material*, CSIA Studies in International Security, no. 12 (Cambridge: The MIT Press. Pre-Publication Draft, December 1995) 78; also, OTA, 67-73.
13. For a fuller discussion of increasing transparency see: Potter, B-7; Allison, 110; and OTA, 68.
14. Stern, 3.
15. OTA, 3-8, 23-29, 67-73; And Allison, 80.
16. Allison, 101-104, 160.
17. Allison, 171.
18. Allison, 172.
19. OTA, 27. Unlike the ISTC, this program is geared toward civilian scientists, not weapon scientists.
20. OTA, 28; Also called IPP see Allison, 91.
21. Theodor Galdi, *The Nunn-Lugar Program for Soviet Weapons Dismantlement: Background and Implementation* (Washington, D.C.: CRS Report for Congress, 94-985 F, 11 December 1995) 12-13.

Chapter 6

Conclusion and Recommendations

CONCLUSION

The U.S. policy regarding nuclear proliferation is a policy of non-proliferation. No new nation is welcome in the "nuclear club." In addition to the United States, the Soviet Union, Britain, France, and China -- the five nuclear weapon states as defined in the Non-Proliferation Treaty -- Israel, Pakistan, and India have developed nuclear weapons as well. While Argentina, Brazil, and South Africa seem to have abandoned their nuclear weapons aspirations, Iraq and Iran continue to pursue their programs. The recent disintegration of the Soviet Union created three "instant" nuclear states, the Ukraine, Kazakhstan, and Belarus. While the former Soviet Republics are transferring nuclear weapons back to Russia, positive control over those weapons and nuclear material, once provided by the Russian Federation, is now suspect.

It is virtually certain that new states will continue to seek to acquire nuclear weapons. The advantages of nuclear ownership, which include enhanced security and status, encourage proliferation. It is impractical to continue to pursue a policy of total nuclear non-proliferation in isolation in the Third Nuclear Age. This policy worked during the Second Nuclear Age, when mutually assured destruction was a deterrent for either of the superpowers to use their nuclear weapons. However, with the umbrella of the Soviet Union removed, not only the proliferation of weapons, but the use of them, has become more likely. Therefore, the United States must expand

its policy options to include one based on cooperation rather than conflict; a policy of nuclear assistance designed to render the weapons of a newly proliferated state more secure and safe.

This policy option is not new. It has been done in the past on an ad hoc basis. The short-term objective of the nuclear assistance is aimed at reducing the possibility of an accidental or unauthorized nuclear detonation, and the long-term objective is to ultimately slow, stop, and roll back nuclear proliferation.

This study proposes that *the United States needs another policy option for dealing with nuclear proliferation which is based on cooperation rather than conflict*. This is a call for nuclear assistance as a policy option to be used in conjunction with existing options. In arriving at this conclusion, this study has developed a nuclear assistance feasibility model to determine actions required to overcome constraints on assistance; examined historical precedent; structured proposed nuclear assistance and organized it into categories; and developed a model to assist in the who, when and what decision. Consequently, nuclear assistance is possible because:

- it is not new; it has been used previously;
- it has worked; the safety record, void of any accidental or unauthorized nuclear detonations, can reasonably be attributable to assistance provided in the past; and
- it is feasible; the information exists; there are avenues available to provide it, and assistance, although constrained, is not totally prohibited.

RECOMMENDATIONS

The United States should develop an adaptive and flexible policy option of nuclear assistance to a newly proliferated nation. At some point, the United States should cease a policy of confrontation and conflict toward a newly proliferated nation and instead, be prepared to assist it to ensure that its weapons are safe and secure. The Cooperative Strategies Model offers one method for achieving this.

The labs in DOE should be directed to examine the types of safety assistance and fail-safe information that can be provided without an unintended offensive result. The DOE should further develop an education program which should include disaster exercises and other pertinent information.

The issue of proliferation is one of the primary foreign policy issues, and probably poses the greatest threat to United States security in the year 2000 and beyond. Therefore, it is recommended that a single individual be given oversight responsibility for the development of this added policy dimension and to resolve conflicting positions within the U.S. government. Based on the priority nature of this issue, this study strongly recommends that the Vice President of the United States serve as the focal point for this examination.¹ The authority of a single office is needed to enhance the interagency management of non-proliferation policy.

Chapter 6 Endnotes

1. A similar need for a single very senior individual to oversee this process was identified in the U.S. Department of Defense, *Directions for Defense, Report of the Commission on Roles and Missions of the Armed Forces* (Washington, D.C.: USGPO, 1995) 2-14.

Appendix A

Nunn-Lugar Lessons Learned

Program problems appear to be primarily organizational and bureaucratic, and perceptual and ideological. By contrasting the different degrees of program success between the Government-to-Government programs and the Lab-to-Lab effort, U.S. organizational problems can be identified.

Problem Category	Problem Description	Problem Solution
Effort	<ul style="list-style-type: none">• Too Little/Too Late/Too Slow	<ul style="list-style-type: none">• Committed Management• Effort Commensurate with Threat Assessment• Long Term Commitment
Management	<ul style="list-style-type: none">• Failure to Construct Cooperative Effort• Managerial Deficiencies Within Component Organizations	<ul style="list-style-type: none">• Camaraderie• Committed Management• Overcome Organizational Resistance to Change
Funding	<ul style="list-style-type: none">• Process Too Cumbersome• Too Many Restrictions	<ul style="list-style-type: none">• Less Encumbered Procurement Bureaucracy• Greater Flexibility to Spend

Problems dealing with perception, many grounded in cultural and ideological differences, include those of realigning the donor-recipient relationship to one of a more balanced partnership,¹ and building trust and confidence.² Misinformation about the program, both in the FSU and the U.S. Congress also threatens its success.³

Appendix A Endnotes

1. Potter and Shields, 10.
2. Stern relates the stories of Minatom official stressing the need for repeated assurance that the U.S. "nuclear tourism" in the CIS is not for the purpose of stealing secrets. In Sterns, 30.
3. Potter and Shields, i.